



Channel Islands
National Marine Sanctuary



Draft Management Plan/
Draft Environmental Impact Statement

Volume II of II:
Draft Environmental Impact Statement



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ABOUT THIS DOCUMENT

This Draft Environmental Impact Statement (DEIS) is Volume II of the revised draft management plan for the Channel Islands National Marine Sanctuary (CINMS). Volume I, the Draft Management Plan (DMP), contains information about the Sanctuary's environment and resources, staffing and administration, priority management issues and actions proposed to address them over the next five years, and performance measures. Volume II, the DEIS, evaluates the potential environmental impacts of the Sanctuary's proposed actions, i.e., the proposed revisions and additions to CINMS regulations. The Sanctuary's proposed actions and several other alternative actions are described in Chapter 2 of this DEIS. The National Oceanic and Atmospheric Administration (NOAA) is the lead agency for this proposed project.

This EIS has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA), 42 U.S.C. 4321 *et seq.*, and its implementing regulations, 40 CFR Parts 1500–1508. The Notice of Intent (NOI) to prepare this EIS (64 FR 31528) is provided in Appendix A.1 of this document.

This EIS has been prepared with the assistance of Tetra Tech, Inc., 4213 State Street # 100, Santa Barbara, 93110.

Comments or questions on this document should be directed to:

Michael Murray
Management Plan Coordinator
Channel Islands National Marine Sanctuary
113 Harbor Way, Suite 150
Santa Barbara, California 93109
(805) 966-7107
michael.murray@noaa.gov

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EXECUTIVE SUMMARY
ENVIRONMENTAL IMPACT STATEMENT (EIS)
FOR THE
CHANNEL ISLANDS NATIONAL MARINE SANCTUARY
MANAGEMENT PLAN/REGULATIONS UPDATE

The National Environmental Policy Act (NEPA) and the Council on Environmental Quality (CEQ) regulations require an agency to prepare an Environmental Impact Statement (EIS) for federal actions that may have significant impacts on the quality of the human environment or that may be controversial in nature. This EIS evaluates the potential environmental impacts associated with proposed revisions to the regulations for the Channel Islands National Marine Sanctuary (CINMS or Sanctuary), offshore California. The National Oceanic and Atmospheric Administration (NOAA) is the lead agency for this proposed project.

This EIS has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA), 42 U.S.C. 4321 *et seq.*, and its implementing regulations, 40 CFR Parts 1500–1508. The EIS presents, to the decision maker and the public, information required to understand the potential environmental consequences of the proposed action and alternatives.

1.0 BACKGROUND

Under the National Marine Sanctuaries Act (NMSA), as amended, 16 U.S.C. 1431 *et seq.*, the Secretary of Commerce (Secretary) is authorized to designate and manage areas of the marine environment as national marine sanctuaries. Such designation is based on attributes of special national significance, namely conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or aesthetic qualities. The primary objective of the NMSA is to protect marine resources.

In addition to the NMSA itself, resource protection for national marine sanctuaries is carried out by regulations under the National Marine Sanctuary Program (NMSP), which are codified at 15 CFR Part 922. The mission of the NMSP “is to identify, designate and manage areas of the marine environment of special national, and in some cases international, significance due to their conservation, recreational, ecological, historical, research, educational, or aesthetic qualities” (15 CFR Part 922.2(a)).

Designated in 1980, the CINMS consists of an area of approximately 1243¹ square nautical miles (NM) off the southern coast of California. The Sanctuary boundary begins at the Mean High Water Line of and extends seaward to a distance of approximately six NM from the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (collectively the Islands). Located offshore from Santa Barbara and Ventura Counties in southern California, the Sanctuary hosts a rich and diverse range of marine life and habitats, unique and productive oceanographic processes and ecosystems, and culturally significant resources.

¹ Since designation the area of CINMS has been described as approximately 1252.5 square nautical miles. However, adjusting for technical corrections and using updated technologies, the CINMS area is now calculated as approximately 1243 square nautical miles. The legal description of CINMS is proposed to be updated to reflect this change (see Vol. II, DEIS, Section 2.1.1). This update would not constitute a change in the geographic area of the Sanctuary but rather an improvement in the estimate of its size.

2.0 PURPOSE AND NEED

The Sanctuary's Designation Document and regulations were published in the Federal Register in 1980 (vol. 45, No. 193), and the original management plan was completed in 1983. No formal review or revision of the management plan or Sanctuary regulations has occurred since that time. Congress, however, has amended the NMSA numerous times, strengthening and clarifying the conservation principles for the program. The amended NMSA calls upon the NMSP to review the management plan of each sanctuary in five-year intervals and to revise the management plan and regulations as necessary to fulfill the purposes and policies of the NMSA (16 U.S.C. 1434(e)).

Sanctuaries are the subject of management plan review in order to:

- Evaluate substantive progress toward implementing the management plan and goals;
- Evaluate the effectiveness of site-specific management techniques and strategies;
- Determine revisions as may be necessary to the management plan and regulations;
- Prioritize management objectives; and
- Inform the general public and Sanctuary constituents about the Sanctuary and management strategies planned for future years.

For the CINMS, there are additional reasons for revising the original management plan. Since its designation as a national marine sanctuary, significant advances in science and technology, as well as innovations in marine resource management techniques, have rendered the original 1983 CINMS management plan and its corresponding EIS significantly outdated. Furthermore, new threats to Sanctuary resources have emerged that require new approaches in CINMS resource management. In addition, the original management plan did not contain performance indicators to help evaluate the effectiveness of either the CINMS or the NMSP. A new management plan is needed to reflect these changes and to guide actions that can achieve effective conservation and management of Sanctuary resources.

The CINMS management plan review began with public scoping in 1999. Following the public scoping process, sanctuary staff, public forum groups, the Channel Islands National Marine Sanctuary Advisory Council (SAC), and NMSP leadership contributed to the identification of nine priority resource management issue categories to be considered in the new management plan: water quality, public awareness and knowledge of the Sanctuary, research and monitoring, enforcement, boundary redefinition, human uses (recreational, commercial, military), marine reserves, marine mammal and seabird protection, administrative issues (performance standards, improved inter-agency coordination). Staff further refined these issue categories and focused the development of action plans and regulatory changes upon priority resource management issues. The draft management plan (DMP) addresses many resource management issues through ten action plans: Public Awareness and Understanding, Conservation Science, Boundary Evaluation, Marine Zoning, Water Quality, Emergency Response and Enforcement, Maritime Heritage Resources, Emerging Issues, Operations, and Evaluation. In addition, the proposed regulatory changes analyzed in this EIS also address several priority resource management issues and were developed to facilitate improved "on the ground" Sanctuary management of such issues. Furthermore, both the proposed changes presented in this DEIS, as well as the in the DMP, are needed to meet the goals and mission of the NMSP (15 C.F.R. Part 922.2(b)). The DMP and DEIS are packaged as a two volume set (the DMP is Volume I and the DEIS is Volume II).

This EIS has been prepared because revisions and updates to the outdated portions of the 1980 CINMS Designation Document are proposed. The Designation Document provides the terms of a sanctuary's designation, i.e.: the geographic area to be designated a national marine sanctuary, the characteristics that give the area particular value, and the types of activities that will be subject to sanctuary regulation to protect those characteristics. Proposed updates and other revisions to the CINMS terms of designation include replacing the term "seabed" with "submerged lands of the Sanctuary" to be consistent with the NMSA, improving accuracy of the boundary coordinates by using the North American Datum of 1983, updating the description of the area based on improved knowledge about the Sanctuary acquired since 1980, and modifications to the Sanctuary's scope of regulations to enable the Sanctuary to address current priority issues via Sanctuary regulations. To meet the requirements of the NMSA, which states in section 304(a)(4) that "the terms of designation may be modified only by the same procedures by which the original designation is made," the NMSP is preparing an EIS (one of the requirements of a designation), regardless of whether one would be required to do so under NEPA.

3.0 SCOPE OF THE EIS

This EIS evaluates the environmental impacts associated with the proposed revised regulatory action and alternatives to the proposed action. The Proposed Action in this EIS consists of revising existing Sanctuary regulations and adopting several new regulations. An alternative to the Proposed Action consists of a regulatory package with slight variations in the proposed regulations. Regulatory changes contained within the preferred alternative (i.e. the Proposed Action) and alternative one are outlined below, described in detail in Section 2 of this EIS, and analyzed in terms of impacts in Section 4 of this EIS. In addition, a No-Action Alternative (i.e., no changes to regulations) is also analyzed in this EIS.

In addition, this EIS presents proposed changes to the Sanctuary's terms of designation (see Section 2.1.18 and Appendix D). The CINMS terms of designation were originally set in 1980 upon establishment of the Sanctuary, and per the NMSA describe the geographic area proposed to be included within the Sanctuary, the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational, or esthetic value, and the types of activities that will be subject to regulation by the Secretary to protect those characteristics (16 U.S.C. 304(a)(4)). In order to implement many of the regulatory changes included in the Proposed Action, the NMSP would need to modify the Sanctuary's terms of designation describing types of activities subject to Sanctuary regulation. Additional proposed changes to the Designation Document include: an updated and more accurate description of the Sanctuary area and characteristics of the area that give it particular value, greater clarity on the applicability of Sanctuary emergency regulations, and an updated explanation of the effect of Sanctuary authority on preexisting leases, permits, licenses, and rights. While most of the proposed regulatory changes presented in this EIS do not meet the NEPA environmental impact statement test of constituting a major federal action significantly affecting the human environment, such as clarifications to the Sanctuary boundary description or wording clarifications to existing regulations, these proposed regulatory changes are nonetheless presented and assessed within this EIS because they relate to associated proposed changes to the Sanctuary's Designation Document. Under the NMSA (16 U.S.C. 1434(a)(4)), alterations to the terms of designation require the Sanctuary to go through the same procedures as site designation, including preparation of an EIS.

This EIS analyzes regulatory changes, not the action plans proposed in the DMP (Vol. 1). The DMP action plans describe non-regulatory management strategies and actions that Sanctuary staff would use to address various issues identified during the management plan review process. Nested within each action plan is a series of strategies, each of which contains detailed actions Sanctuary staff would take over the next five years in order to meet CINMS goals and objectives. These strategies comprise activities ranging from program planning, budgeting, administrative services, mapping, vessel and aircraft operations, to

basic and applied research and monitoring activities, education and outreach services, and advisory body activities. Section 6.03(c)(3)(d) of NOAA Administrative Order 216-6 (48 FR 14734) specifies that these and other administrative or routine program functions that have no potential for significant environmental impacts are eligible for a categorical exclusion. The NMSP has determined that the proposed actions within the DMP (Vol. I) individually and cumulatively will have no significant impact on the environment and, therefore, qualify for a categorical exclusion from NEPA's requirement for conducting an environmental assessment or preparing an EIS. Thus, the DMP's planned activities are not included or analyzed within this DEIS.

During 1999 public scoping meetings members of the public frequently raised issues relating to Sanctuary boundary expansion and marine reserves; however, an assessment of these issues is beyond the scope of this EIS. The DMP (Vol. I) includes a Boundary Evaluation Action Plan and a Marine Zoning Action Plan describing the Sanctuary's separate and future planned environmental review processes to address these matters. The former outlines future steps of a NOAA National Centers for Coastal Ocean Science (NCCOS) biogeographic study, the results of which will be included in a supplemental environmental review process designed to yield a future decision on whether to modify the Sanctuary's outer boundary. The supplemental environmental review process will be NEPA-compliant and will result in a supplemental EIS (SEIS) and supplemental management plan. The proposed regulations addressed in this EIS would only apply to the existing CINMS boundaries, while the applicability of Sanctuary regulations to various boundary alternatives will be evaluated in the SEIS. Similarly, the Marine Zoning Action Plan explains that the Sanctuary initiated a separate ongoing NEPA process in 2003 to consider establishing a network of marine reserves and/or marine conservation areas within the Sanctuary to complement those implemented by the State of California in 2003. This separate ongoing NEPA process will be concluded subsequent to this management plan revision. As such the consideration of Sanctuary boundary expansions and marine reserve zoning is outside the scope of this EIS.

4.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The Proposed Action consists of adopting revisions to the existing regulations plus adoption of several proposed new regulations. An alternative to the Proposed Action consists of a regulatory package with slight variations to the proposed regulations and one additional proposed new regulation. The No-Action Alternative would consist of leaving the current regulations unchanged.

Revisions of existing Sanctuary regulations included in the Proposed Action would:

- clarify that Sanctuary boundaries encompass the submerged lands;
- correct some inaccuracies and ambiguities in the coordinates and description of the Sanctuary's outer and shoreline boundaries;
- remove outdated and unnecessary oil spill contingency equipment requirements;
- clarify that discharges allowed from marine sanitation devices apply only to Type I and Type II marine sanitation devices;
- provide an exemption for discharges by vessels of the Armed Forces allowed under section 312(n) of the Federal Water Pollution Control Act;
- specify that the existing exception for discharging or depositing fish, fish parts, or chumming materials (bait) applies only to such discharges or deposits during the conduct of lawful fishing activity within the Sanctuary;
- remove an exception for discharging or depositing meals on board vessels;

- prohibit discharges or deposits of any material or other matter from beyond the boundary of the Sanctuary that subsequently enter the Sanctuary and injure a Sanctuary resource or quality;
- extend from 2 NM to the outer 6 NM Sanctuary boundary the existing prohibition on alteration of the submerged lands of the Sanctuary;
- prohibit vessels of 300 gross registered tons or more (excluding fishing and/or kelp harvesting vessels) from approaching within 1 NM of the Islands;
- revise and strengthen the existing protection of cultural resources to prohibit moving, possessing, injuring, or attempting to move, remove, injure or possess any Sanctuary historical resource;
- clarify, update and refine the regulation of Department of Defense activities occurring within the Sanctuary to, among other things, provide more consistency with the NMSA as currently written; and
- conform wording, where appropriate, to wording used for more recently designated sanctuaries.

New regulations included in the Proposed Action would prohibit:

- exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to authorized hydrocarbon production;
- abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary;
- taking any marine mammal, sea turtle, or seabird within or above the Sanctuary, except as expressly authorized by the Marine Mammal Protection Act, as amended, (MMPA), 16 U.S.C. 1361 et seq., Endangered Species Act, as amended, (ESA), 16 U.S.C. 1531 et seq., Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. 703 et seq., or any regulation, as amended, promulgated under these acts;
- possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as expressly authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA;
- marking, defacing, damaging, moving, removing, or tampering with any sign, notice or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary;
- introducing or otherwise releasing an introduced species from within or into the Sanctuary; and
- operating a motorized personal watercraft within waters of the Channel Islands National Park, established by 16 U.S.C. 410(ff).

In addition, the Proposed Action includes revised and clarified Sanctuary permit regulations that would:

- add specificity to and slightly expand the types of activities for which the Director of the NMSP may issue permits;
- specify which otherwise prohibited activities would not be allowed under any Sanctuary permit;
- revise and clarify permit issuance criteria;
- further refine current requirements and procedures from general National Marine Sanctuary Program regulations (15 CFR 922.48(a) and (c));
- specify information about permit duration, timelines and procedures for permit processing, permit review, and procedures and criteria for permit renewal;
- expressly require that in addition to any other terms and conditions the Director deems appropriate, Sanctuary permits must require that the permittee agrees to hold the United States harmless against any claims arising out of the permitted activities; and

- expressly provide that a permittee may be required to purchase and maintain general liability insurance or other acceptable security against potential claims for destruction, loss of, or injury to Sanctuary resources arising out of the permitted activities.

Alternative One includes the proposed suite of new and revised regulations in the Proposed Action described above, along with more stringent regulatory language for the prohibitions on discharging or depositing material or other matter from within or into the Sanctuary, and operation of vessels within one NM of Island shores. The more stringent language would:

- specify that the exception for discharges or deposits generated by operable Type I or II marine sanitation devices does not apply to such discharges or deposits from vessels of 300 gross registered tons or more; and
- prohibit vessels of 150 gross registered tons or more (excluding fishing and kelp harvesting vessels) from operating within 1 NM of the Islands.

The additional proposed regulation found exclusively in Alternative One prohibits lightering (defined in Program-wide regulations as at-sea transfer of petroleum-based products, materials, or other matter from vessel to vessel, 15 CFR Part 922.3) within the Sanctuary.

5.0 SUMMARY OF THE ANTICIPATED ENVIRONMENTAL IMPACTS

Impacts to the physical and biological environment, cultural/historical resources, and human uses of the CINMS are defined and evaluated in Section 4 of this DEIS. No significant adverse impacts to any of these categories would occur as a result of implementing the Proposed Action. No cumulative impacts and less than adverse socioeconomic impacts would occur as well. Implementing the Proposed Action would have significant long-term beneficial effects on the physical and biological environments, on historical resources, and would benefit many of the resource-dependent human uses of the Sanctuary, such as fishing, recreation, tourism, research, and education. Table ES-1 provides a summary of impacts under the Proposed Action.

Table ES-1 Summary of Impacts Under the Proposed Action (PAGE 1 OF 3)

<p style="text-align: center;"><u>Legend</u></p> <ul style="list-style-type: none"> - No impact < Less than significant adverse impact > Significant adverse impact + Beneficial impact <p><u>Note: Proposed regulatory changes are summarized</u></p>	Physical Environment	Biological Environment	Cultural/Historical Resources	Human Use												
				Oil & Gas	Tele-communications	Minerals Mining	Vessels & Harbors	Commercial Fishing	Recreation & Tourism (consumptive and non-consumptive)	Marine Salvage Businesses	Motorized Personal Watercraft	Aviation	Research & Education	Department of Defense		
Prohibition 1 (modification): Exploring for, Developing, or Producing Hydrocarbons																
Remove outdated and unnecessary oil spill contingency equipment requirements for offshore oil industry operations at leased areas partially within the Sanctuary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prohibition 2 (new): Exploring for, Developing, or Producing Minerals	+	+	+	-	-	<	-	+	+	-	-	-	+	-	-	-
Prohibition 3 (modifications): Discharge or Deposit																
Specify that the existing exception for discharging or depositing fish, fish parts, or chumming materials (bait) applies only to lawful fishing activity within the Sanctuary	-	+	-	-	-	-	-	-	<	-	-	-	<	-	-	-
Remove an exception for discharging or depositing meals on board vessels	-	+	-	-	-	-	<	<	<	<	-	-	<	-	-	-
Clarify that discharges allowed from marine sanitation devices apply only to Type I and Type II marine sanitation devices	+	+	-	-	-	-	<	<	<	<	-	-	<	-	-	-
Prohibit discharges and deposits of any material or other matter from beyond the boundary of the Sanctuary that subsequently enters the Sanctuary and injures a Sanctuary resource or quality	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prohibition 4 (modification): Altering the Seabed																

Legend	Physical Environment	Biological Environment	Cultural/Historical Resources	Human Use										
				Oil & Gas	Tele-communications	Minerals Mining	Vessels & Harbors	Commercial Fishing	Recreation & Tourism (consumptive and non-consumptive)	Marine Salvage Businesses	Motorized Personal Watercraft	Aviation	Research & Education	Department of Defense
<ul style="list-style-type: none"> - No impact < Less than significant adverse impact > Significant adverse impact + Beneficial impact <p><u>Note: Proposed regulatory changes are summarized</u></p>														
Extend from 2 NM to 6 NM from Islands the existing prohibition on alteration of the submerged lands of the Sanctuary	+	+	+	-	<	<	-	+	+	-	-	-	+	-
Prohibition 5 (new): Abandoning any structure, material or other matter on or in the submerged lands of the Sanctuary	+	+	+	-	-	-	<	+	+	+	-	-	+	-
Prohibition 6 (modification): Nearshore Operation of Vessels														
Prohibit vessels of 300 gross registered tons or more (excluding fishing and kelp harvesting vessels) from approaching within 1 NM of the Islands	+	+	+	-	-	-	-	+	<	-	-	-	<	-
Prohibition 7 (modification): Disturbing a Seabird or Marine Mammal by Aircraft Overflight – minor wording changes	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prohibition 8 (modification): Moving, Removing, or Injuring a Historical Resource														
Revise and strengthen to prohibit “moving, possessing, injuring or attempting to move, remove, or injure any Sanctuary historical resource”	-	-	+	-	-	-	-	-	+	-	-	-	+	-
Prohibition 9 (new): Taking a Marine Mammal, Sea Turtle, or Seabird except as authorized under the Marine Mammal Protection Act, the Endangered Species Act, or the Migratory Bird Treaty Act	-	+	-	-	-	-	-	-	+	-	-	-	+	-
Prohibition 10 (new): Possessing Marine Mammals, Sea Turtles, or Seabirds except as authorized under	-	+	-	-	-	-	-	-	+	-	-	-	+	-

Legend	Physical Environment	Biological Environment	Cultural/Historical Resources	Human Use											
				Oil & Gas	Tele-communications	Minerals Mining	Vessels & Harbors	Commercial Fishing	Recreation & Tourism (consumptive and non-consumptive)	Marine Salvage Businesses	Motorized Personal Watercraft	Aviation	Research & Education	Department of Defense	
- No impact < Less than significant adverse impact > Significant adverse impact + Beneficial impact <u>Note: Proposed regulatory changes are summarized</u>															
the Marine Mammal Protection Act, the Endangered Species Act, or the Migratory Bird Treaty Act															
Prohibition 11 (new): Protection of Sanctuary Signs and Markers	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Prohibition 12 (new): Releasing an Introduced Species within or into the Sanctuary	+	+	+	-	-	-	-	+	+	-	-	-	+	-	-
Prohibition 13 (new): Operation of Motorized Personal Watercraft within Channel Islands National Park	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
Sanctuary Boundary Description and Coordinates Clarifications (modifications)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exemptions and Requirements for Department of Defense Activities (modifications)	<	<	<	-	-	-	-	<	<	-	-	-	<	-	-
Permit Procedures and Issuance Criteria (modifications)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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1 INTRODUCTION

1.0 INTRODUCTION

This Draft Environmental Impact Statement (DEIS) is Volume II of a two-volume set that is the result of an extensive management plan review process at the Channel Islands National Marine Sanctuary (CINMS or Sanctuary), offshore California. Volume I, the Draft Management Plan (DMP), contains information about the Sanctuary's environment and resources, staffing and administration, priority management issues and actions proposed to address them over the next five years, and performance measures. Volume II, the DEIS, evaluates the potential environmental impacts of the Sanctuary's proposed actions, i.e., the proposed revisions and additions to CINMS regulations. The Sanctuary's proposed actions and several other alternative actions are described in Chapter 2 of this DEIS. The National Oceanic and Atmospheric Administration (NOAA) is the lead agency for this proposed project.

This EIS has been prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA), 42 U.S.C. 4321 *et seq.*, and its implementing regulations, 40 CFR Parts 1500–1508. The Notice of Intent (NOI) to prepare this EIS (64 FR 31528) is provided in Appendix A.1 of this document.

1.1 THE NATIONAL MARINE SANCTUARY PROGRAM

Under the National Marine Sanctuaries Act, as amended, 16 U.S.C. 1431 *et seq.*, (NMSA) the Secretary of Commerce (Secretary) is authorized to designate and manage areas of the marine environment as national marine sanctuaries. Such designation is based on attributes of special national significance, including conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or aesthetic qualities. The primary objective of the NMSA is to protect Sanctuary resources.

Per the NMSA, the National Marine Sanctuary Program (NMSP) strives to improve the conservation and management of marine resources and will “maintain for future generations the habitat, and ecological services, of the natural assemblage of living resources that inhabit these areas” (16 U.S.C. 1431 (a)(4)(c)). This statutory finding guides the NMSP to take a broad and comprehensive management approach consistent with the NMSA's primary objective of resource protection. The focus of such an approach is broad-scale, ecosystem-level protection and management, unique vis-à-vis the various agencies and laws directed at managing single or limited numbers of species or specific human activities within the ocean. As such, ecosystem-based management serves as the framework for the proposed revised CINMS management plan.

To date, thirteen national marine sanctuaries have been designated. (The Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve is currently undergoing the sanctuary designation process.) These sanctuaries include both nearshore and offshore areas. Their designation provides protection for sensitive marine ecosystems, such as coral reefs and kelp forests, habitat used by important marine species, and historically significant shipwrecks and artifacts. In addition, these areas serve as valuable educational, recreational, scientific, and commerce resources. National Marine Sanctuary Program regulations are carried out under the NMSA and are codified at 15 CFR Part 922. The mission of the NMSP “is to identify, designate and manage areas of the marine environment of special national, and in some cases international, significance due to their conservation, recreational, ecological, historical, research, educational, or aesthetic qualities.”

The NMSP regulations include prohibitions on specific kinds of activities, descriptions of sanctuary boundaries, and a permitting system to allow certain types of activities to be conducted within sanctuaries that would otherwise be prohibited. Each of the thirteen national marine sanctuaries has its own set of

site-specific regulations within subparts F through R of 15 CFR Part 922. The regulations for the CINMS are found at Subpart G.

1.1.1 Channel Islands National Marine Sanctuary

Designated in 1980, the CINMS consists of an area of approximately 1,243¹ square nautical miles (NM) off the southern coast of California. The Sanctuary boundary begins at the Mean High Water Line of and extends seaward to a distance of approximately six NM from the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (the Islands). Located offshore from Santa Barbara and Ventura Counties in southern California, the Sanctuary supports a rich and diverse range of marine life and habitats, unique and productive oceanographic processes and ecosystems, and culturally significant resources such as hundreds of shipwrecks and submerged Chumash cultural artifacts. The physical, biological, and cultural characteristics of the Sanctuary combined provide outstanding opportunities for scientific research, education, recreation, and commerce. Examples of these include commercial and recreational fisheries, marine wildlife viewing, sailing, boating, kayaking and other recreational activities, maritime shipping, and nearby offshore oil and gas development. More details about the Sanctuary environment and human setting may be found in Section 3 of this EIS, and in Section II of the Draft Management Plan.

1.2 PROJECT LOCATION

As indicated above, the CINMS consists of an area off the southern coast of California, of approximately 1,243 square NM. The Sanctuary begins at the Mean High Water Line of the Islands and extends seaward to a distance of approximately 6 NM. The four northern Islands, Anacapa, Santa Cruz, Santa Rosa, and San Miguel, are in waters approximately 20 statute miles south of the Santa Barbara and Ventura County coast. Santa Barbara Island is approximately 50 statute miles southwest of the shoreline of Los Angeles and 30 statute miles west of the westernmost part of Santa Catalina Island. The CINMS is also at the northwestern end of a much larger area referred to as the Southern California Bight (SCB). The SCB is formed by a transition in the California coastline wherein the north-south trending coast begins to trend east-west. Figure 1.2-1 shows the regional location of the CINMS; the Study Area for this EIS, including the CINMS boundary and surrounding area, is shown in more detail in Figure 1.2-2.

¹ Since designation the area of CINMS has been described as approximately 1252.5 square nautical miles. However, adjusting for technical corrections and using updated technologies, the CINMS area is now calculated as approximately 1243 square nautical miles. The legal description of CINMS is proposed to be updated to reflect this change (see Vol. II, DEIS, Section 2.1.1). This update would not constitute a change in the geographic area of the Sanctuary but rather an improvement in the estimate of its size.

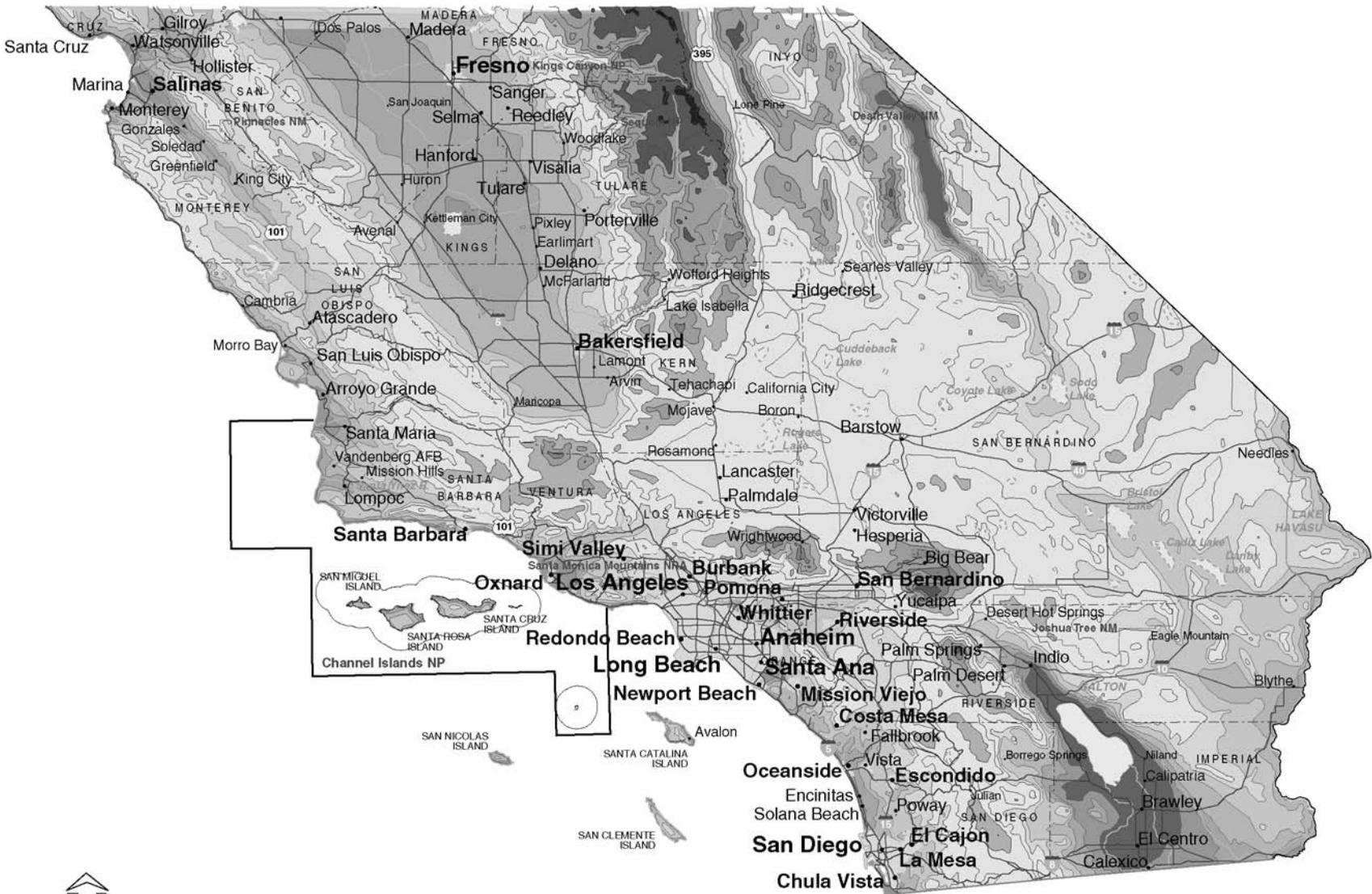
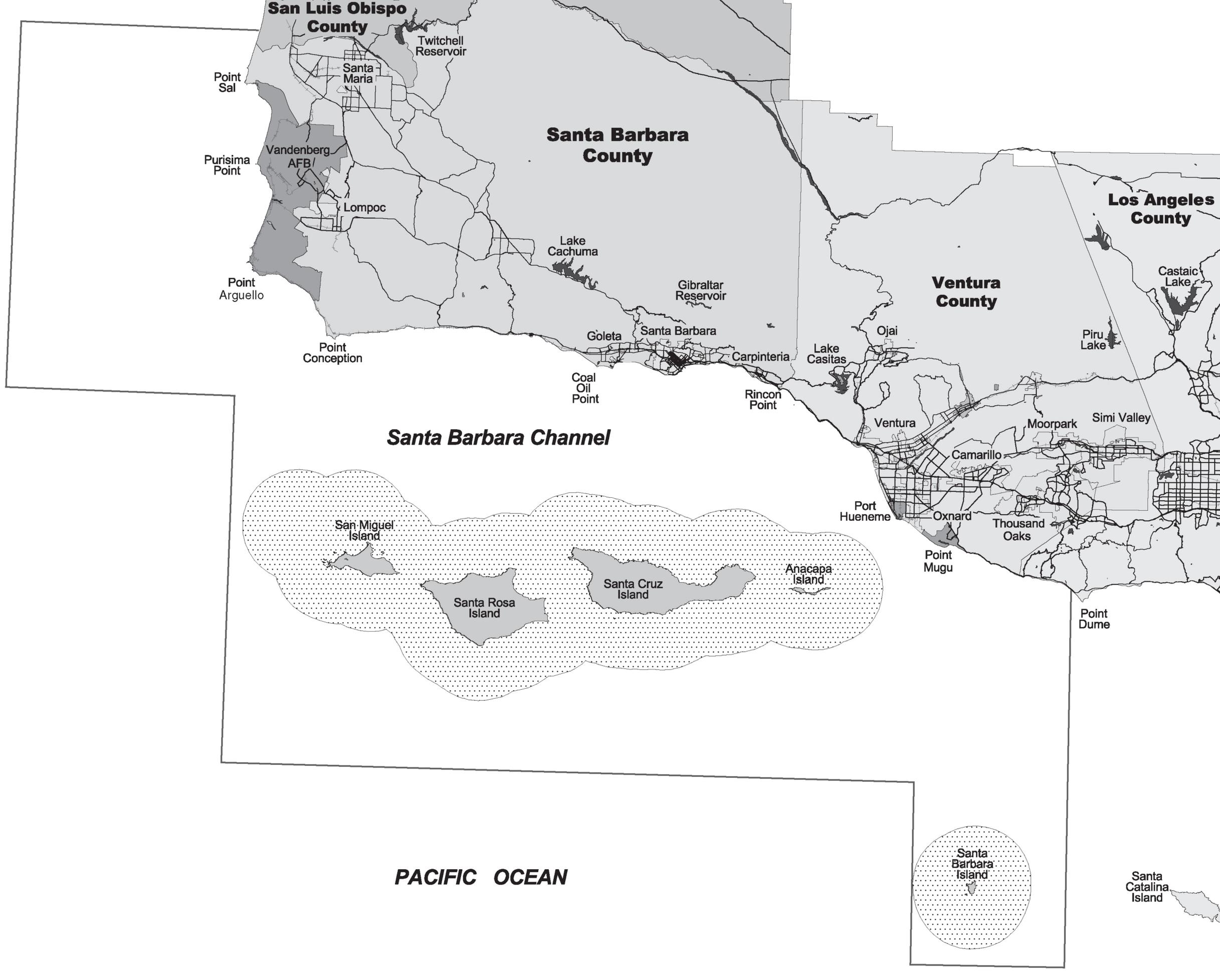


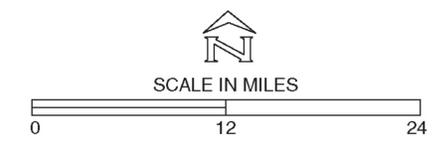
Figure 1.2-1

REGIONAL LOCATION OF THE CINMS EIS STUDY AREA

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- LEGEND**
- ROADS
 - STUDY AREA BOUNDARY
 - RAILROAD
 - LAKES
 - LANDMARKS
 - PLACES
 - SANTA BARBARA CHANNEL ISLANDS
 - LOS ANGELES COUNTY
 - SAN LUIS OBISPO COUNTY
 - SANTA BARBARA COUNTY
 - VENTURA COUNTY
 - EXISTING CINMS BOUNDARY



**CINMS EIS STUDY AREA
LOCATION MAP**

	Tetra Tech, Inc. 4213 State Street, Suite 100 Santa Barbara, CA 93110-2847			
	TC# 10871-01	DATE 11/11/03	DRAWN BY IGE	FIGURE NO. 1.2-2

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Channel Island\
1.2-2 StudyAreaLoc.ai

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1.3 PURPOSE AND NEED

The Sanctuary's Designation Document and regulations were published in the Federal Register in 1980 (vol. 45, No. 193), and the original management plan was completed in 1983. No formal review or revision of the management plan or Sanctuary regulations has occurred since that time. Congress, however, has amended the NMSA numerous times, strengthening and clarifying the conservation principles for the program. The amended NMSA calls upon the NMSP to review the management plan of each sanctuary in five-year intervals and to revise the management plan and regulations as necessary to fulfill the purposes and policies of the NMSA (16 U.S.C. 1434(e)).

Sanctuaries are the subject of management plan review in order to:

- Evaluate substantive progress toward implementing the management plan and goals;
- Evaluate the effectiveness of site-specific management techniques and strategies;
- Determine revisions as may be necessary to the management plan and regulations;
- Prioritize management objectives; and
- Inform the general public and Sanctuary constituents about the Sanctuary and management strategies planned for future years.

For the CINMS, there are additional reasons for revising the original management plan. Since its designation as a national marine sanctuary, significant advances in science and technology, as well as innovations in marine resource management techniques, have rendered the original 1983 CINMS management plan and its corresponding EIS significantly outdated. Furthermore, new threats to Sanctuary resources have emerged, requiring new approaches in CINMS resource management. In addition, the original management plan did not contain performance indicators to help evaluate the effectiveness of either the CINMS or the NMSP. A new management plan is needed to reflect these changes and to guide actions that can achieve effective conservation and management of Sanctuary resources.

The CINMS management plan review began with public scoping in 1999. Following the public scoping process, Sanctuary staff, public forum groups, the Channel Islands National Marine Sanctuary Advisory Council (SAC), and NMSP leadership contributed to the identification of nine priority resource management issue categories to be considered in the new management plan:

- Water quality;
- Public awareness and knowledge of the Sanctuary;
- Research and monitoring;
- Enforcement;
- Boundary change;
- Human uses (recreational, commercial, military);

- Marine reserves;
- Marine mammal and seabird protection; and
- Administrative issues (performance standards, improved inter-agency coordination).

Staff further refined these issue categories and focused the development of action plans and regulatory changes upon priority resource management issues. Specific regulatory changes proposed and analyzed in this EIS address several priority resource management issues. The DMP (Vol. I) addresses many resource management issues through ten action plans: Public Awareness and Understanding, Conservation Science, Boundary Evaluation, Marine Zoning, Water Quality, Emergency Response and Enforcement, Maritime Heritage Resources, Emerging Issues, Operations, and Evaluation.

This document has been prepared, in part, because NEPA requires federal agencies to prepare an appropriate environmental analysis - either an Environmental Impact Statement (EIS) or Environmental Assessment (EA) - to thoroughly assess the environmental impacts of major federal actions that could significantly affect the human environment.

In addition, this EIS has been prepared because revisions and updates to the outdated portions of the 1980 CINMS Designation Document are proposed. The Designation Document provides the terms of a sanctuary's designation, i.e.: the geographic area to be designated a national marine sanctuary, the characteristics that give the area particular value, and the types of activities that will be subject to sanctuary regulation to protect those characteristics. Proposed updates and other revisions to the CINMS terms of designation include replacing the term "seabed" with "submerged lands of the Sanctuary" to be consistent with the NMSA, improving accuracy of the boundary coordinates by using the North American Datum of 1983, updating the description of the area based on improved knowledge about the Sanctuary acquired since 1980, and modifications to the Sanctuary's scope of regulation to enable the Sanctuary to address current priority issues via Sanctuary regulations. To meet the requirements of the NMSA, which states in section 304(a)(4) that "the terms of designation may be modified only by the same procedures by which the original designation is made," the NMSP is preparing an EIS (one of the requirements of a designation).

The proposed CINMS regulatory changes have been specifically developed to facilitate improved "on the ground" Sanctuary management of identified priority resource management issues. Furthermore, both the proposed changes presented in this DEIS, as well as those in the DMP (Vol. I), are needed to meet the purposes and policies of the NMSA (16 U.S.C. 1431(b)):

- (1) To identify and designate as national marine sanctuaries areas of the marine environment which are of special national significance and to manage these areas as the National Marine Sanctuary System;
- (2) To provide authority for comprehensive and coordinated conservation and management of these marine areas, and activities affecting them, in a manner which complements existing regulatory authorities;
- (3) To maintain the natural biological communities in the national marine sanctuaries, and to protect, and, where appropriate, restore and enhance natural habitats, populations, and ecological processes;

- (4) To enhance public awareness, understanding, appreciation, and wise and sustainable use of the marine environment, and the natural, historical, cultural, and archeological resources of the National Marine Sanctuary System;
- (5) To support, promote, and coordinate scientific research on, and long-term monitoring of, the resources of these marine areas;
- (6) To facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities;
- (7) To develop and implement coordinated plans for the protection and management of these areas with appropriate Federal agencies, state and local governments, Native American tribes and organizations, international organizations, and other public and private interests concerned with the continuing health and resilience of these marine areas;
- (8) To create models of, and incentives for, ways to conserve and manage these areas, including the application of innovative management techniques; and
- (9) To cooperate with global programs encouraging conservation of marine resources.

1.4 SCOPE OF THIS EIS

This EIS evaluates the environmental impacts associated with the proposed revised regulatory action and alternatives to the proposed action. The Proposed Action in this EIS consists of revising existing Sanctuary regulations and adopting several new regulations. An alternative to the Proposed Action consists of a regulatory package with slight variations in the proposed regulations. Regulatory changes contained within the preferred alternative (i.e. the Proposed Action) and alternative one are outlined below, described in detail in Section 2 of this EIS, and analyzed in terms of impacts in Section 4 of this EIS. In addition, a No-Action Alternative (i.e., no changes to regulations) is also analyzed in this EIS.

Revisions of existing Sanctuary regulations included in the Proposed Action would:

- clarify that Sanctuary boundaries encompass the submerged lands;
- correct some inaccuracies and ambiguities in the coordinates and description of the Sanctuary's outer and shoreline boundaries;
- remove outdated and unnecessary oil spill contingency equipment requirements;
- clarify that discharges allowed from marine sanitation devices apply only to Type I and Type II marine sanitation devices;
- provide an exemption for discharges by vessels of the Armed Forces allowed under section 312(n) of the Federal Water Pollution Control Act;
- specify that the existing exception for discharging or depositing fish, fish parts, or chumming materials (bait) applies only to such discharges or deposits during the conduct of lawful fishing activity within the Sanctuary;
- remove an exception for discharging or depositing meals on board vessels;
- prohibit discharges or deposits of any material or other matter from beyond the boundary of the Sanctuary that subsequently enter the Sanctuary and injure a Sanctuary resource or quality;
- extend from 2 NM to the outer 6 NM Sanctuary boundary the existing prohibition on alteration of the submerged lands of the Sanctuary;

- prohibit vessels of 300 gross registered tons or more (excluding fishing and/or kelp harvesting vessels) from approaching within 1 NM of the Islands;
- revise and strengthen the existing protection of cultural resources to prohibit moving, possessing, injuring, or attempting to move, remove, injure or possess any Sanctuary historical resource;
- clarify, update and refine the regulation of Department of Defense activities occurring within the Sanctuary to, among other things, provide more consistency with the NMSA as currently written; and
- conform wording, where appropriate, to wording used for more recently designated sanctuaries.

New regulations included in the Proposed Action would prohibit:

- exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to authorized hydrocarbon production;
- abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary;
- taking any marine mammal, sea turtle, or seabird within or above the Sanctuary, except as expressly authorized by the Marine Mammal Protection Act, as amended, (MMPA), 16 U.S.C. 1361 et seq., Endangered Species Act, as amended, (ESA), 16 U.S.C. 1531 et seq., Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. 703 et seq., or any regulation, as amended, promulgated under these acts;
- possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as expressly authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA;
- marking, defacing, damaging, moving, removing, or tampering with any sign, notice or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary;
- introducing or otherwise releasing an introduced species from within or into the Sanctuary; and
- operating a motorized personal watercraft within waters of the Channel Islands National Park, established by 16 U.S.C. 410(ff).

In addition, the Proposed Action includes revised and clarified Sanctuary permit regulations that would:

- add specificity to and slightly expand the types of activities for which the Director of the NMSP may issue permits;
- specify which otherwise prohibited activities would not be allowed under any Sanctuary permit;
- revise and clarify permit issuance criteria;
- further refine current requirements and procedures from general National Marine Sanctuary Program regulations (15 CFR 922.48(a) and (c));
- specify information about permit duration, timelines and procedures for permit processing, permit review, and procedures and criteria for permit renewal;
- expressly require that in addition to any other terms and conditions the Director deems appropriate, Sanctuary permits must require that the permittee agrees to hold the United States harmless against any claims arising out of the permitted activities; and
- expressly provide that a permittee may be required to purchase and maintain general liability insurance or other acceptable security against potential claims for destruction, loss of, or injury to Sanctuary resources arising out of the permitted activities.

Alternative One includes the proposed suite of new and revised regulations in the Proposed Action described above, along with more stringent regulatory language for the prohibitions on discharging or depositing material or other matter from within or into the Sanctuary, and operation of vessels within one NM of Island shores. The more stringent language would:

- specify that the exception for discharges or deposits generated by operable Type I or II marine sanitation devices does not apply to such discharges or deposits from vessels of 300 gross registered tons or more; and
- prohibit vessels of 150 gross registered tons or more (excluding fishing and kelp harvesting vessels) from operating within 1 NM of the Islands.

The additional proposed regulation found exclusively in Alternative One prohibits lightering (defined in Program-wide regulations as at-sea transfer of petroleum-based products, materials, or other matter from vessel to vessel, 15 CFR Part 922.3) within the Sanctuary.

Finally, this EIS presents proposed changes to the Sanctuary's terms of designation (see Section 2.1.18 and Appendix D). The CINMS terms of designation were originally set in 1980 upon establishment of the Sanctuary, and per the NMSA describe the geographic area proposed to be included within the Sanctuary, the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational, or esthetic value, and the types of activities that will be subject to regulation by the Secretary to protect those characteristics (16 U.S.C. 304(a)(4)). In order to implement many of the regulatory changes included in the Proposed Action, the NMSP would need to modify the Sanctuary's terms of designation describing types of activities subject to Sanctuary regulation. Additional proposed changes to the Designation Document include: an updated and more accurate description of the Sanctuary area and characteristics of the area that give it particular value, greater clarity on the applicability of Sanctuary emergency regulations, and an updated explanation of the effect of Sanctuary authority on preexisting leases, permits licenses and rights. While most of the proposed regulatory changes presented in this EIS do not meet the NEPA environmental impact statement test of constituting a major federal action significantly affecting the human environment, such as clarifications to the Sanctuary boundary description or wording clarifications to existing regulations, these proposed regulatory changes are nonetheless presented and assessed within this EIS because they relate to associated proposed changes to the Sanctuary's Designation Document. Under the NMSA (16 U.S.C. 1434(a)(4), alterations to the terms of designation require the Sanctuary to go through the same procedures as site designation, including preparation of an EIS.

This EIS analyzes regulatory changes, not the action plans proposed in the DMP (Vol. 1). The DMP action plans describe non-regulatory management strategies and actions that Sanctuary staff would use to address various issues identified during the management plan review process. Nested within each action plan is a series of strategies, each of which contains detailed actions Sanctuary staff would take over the next five years in order to meet CINMS goals and objectives. These strategies comprise activities ranging from program planning, budgeting, administrative services, mapping, vessel and aircraft operations, to basic and applied research and monitoring activities, education and outreach services, and advisory body activities. Section 6.03(c)(3)(d) of NOAA Administrative Order 216-6 specifies that these and other administrative or routine program functions that have no potential for significant environmental impacts are eligible for a categorical exclusion. The NMSP has determined that the proposed actions within the DMP (Vol. I) individually and cumulatively have no potential for significant impact on the environment and, therefore, qualify for a categorical exclusion from NEPA's general requirement for conducting an environmental assessment or preparing an EIS. Thus, the DMP's planned activities are not included or analyzed within this DEIS.

1.5 ISSUES BEYOND THE SCOPE OF THIS EIS

The proposed action and alternatives presented and analyzed within this DEIS do not include consideration of Sanctuary boundary expansion or the designation of marine reserves (no-take areas) or

marine conservation areas (limited-take zones) within the Sanctuary. These considerations are explained briefly below, as well as in the Marine Zoning Action Plan and Boundary Evaluation Action Plan within the DMP (Vol. I), which describe the Sanctuary's separate and future planned environmental review processes to address these matters.

1.5.1 Boundary Expansion

During the 1999 public scoping meetings, and subsequently over the next two years, the most frequently raised public topic was CINMS boundary expansion. Although some did not support an expanded Sanctuary boundary, CINMS staff received hundreds of e-mails and letters (including three petitions with over 1,500 signatures) in support of enlarging the Sanctuary. Many of these letters encouraged the Sanctuary to improve its ecosystem representation by expanding the Sanctuary boundary to the mainland coast. Other reasons for expanding the boundary were to address watershed runoff, oil and gas development, water quality threats, military activity impacts, and to provide better overall marine resource protection.

From 1999 through 2001, based on input received during the public scoping process and over the course of several SAC meetings and workshops, Sanctuary staff and the SAC developed a preliminary range of boundary concepts to be considered as possible redefined outer boundaries for the CINMS. These ideas included the status quo boundary option plus five new preliminary boundary configurations. Maps and descriptions of these boundary configurations are presented in Appendix D of the DMP (Vol. I).

In 2002 NOAA determined that additional scientific data collection and analysis would be desirable in order to evaluate the effectiveness of each boundary configuration in meeting NMSP goals. In response, NOAA's National Centers for Coastal Ocean Science (NCCOS) initiated a biogeographic study in January 2003.

Because further analysis of boundary change options remains to be completed, the proposed action and alternatives presented and analyzed within this DEIS do not include consideration of expanding the Sanctuary's boundary. Therefore, this DEIS analyzes the proposed regulatory alternatives solely within the existing Sanctuary boundary. However, the Boundary Evaluation Action Plan within the DMP (Vol. I) calls for the continuation of the biogeographic study and, beyond that, the initiation of a supplemental comprehensive, scientifically-based, open public environmental review process that will lead to a sound future decision on the Sanctuary's boundary and the application of Sanctuary regulations within that selected boundary. Regulations for areas of any proposed boundary expansion may or may not be identical to those proposed for the existing Sanctuary boundary; the regulations applicable to each boundary concept will be evaluated in the supplemental EIS. Reaching a final decision on this issue would involve a NEPA-compliant supplemental environmental impact analysis process, resulting in a supplemental EIS and supplemental management plan. That future process, outlined below in Figure 1.6-1, will provide several additional opportunities for public comment. At this time, the preliminary boundary concepts previously developed with community input are available for public comment and provided in Appendix D of the DMP (Vol. I).

1.5.2 Marine Reserves and Conservation Areas

To address a number of concerns related to the need to increase protection of the Sanctuary's natural resources, scoping comments recommended the use of marine reserves (no-take areas) as an ecosystem management tool. In 1999, the marine reserves working group (MRWG) of the SAC began the process of considering marine reserves as a tool for use within the Sanctuary, along with monitoring, research, education, and enforcement strategies. In 2001, the SAC presented its recommendations to CINMS staff

and the California Department of Fish and Game (CDFG). On October 23, 2002, the California Fish and Game Commission adopted a network of ten marine reserves and two marine conservation areas (all referred to as marine protected areas) in portions of the state waters within CINMS. Sanctuary staff have since been cooperating with several state and federal agencies to manage these marine protected areas. Additional details of Sanctuary efforts to support enforcement, monitoring, and education pertaining to the Channel Islands state marine protected areas are provided in the DMP's Action Plans (Vol. I).

In 2003, a separate federal environmental review process was initiated to consider establishment of a complementary network of marine reserves and/or marine conservation areas within the Sanctuary. This is a separate ongoing NEPA process, and will be concluded subsequent to this management plan revision. As such the consideration of marine reserve zoning is outside the scope of this EIS. Furthermore, the proposed action plans and regulations described in this DMP and EIS could be implemented whether or not any future action is taken to establish complementary federal marine reserves or conservation areas within the CINMS, and, likewise, no part of the proposed action in this EIS directs or influences a future decision on the separate process to consider marine reserves and conservation areas.

1.6 NEPA PUBLIC COMMENT PROCESS

Public comment is an important part of the scoping process for an EIS, and an important part of the broader management plan review process (described in more detail in the introduction to Vol. I). Associated with public scoping are procedures aimed at facilitating review and input from interested and affected parties. Soliciting public comment begins when the notice of intent (NOI) is published in the *Federal Register* (Appendix A.1) and continues through the preparation of the EIS.

1.6.1 Council on Environmental Quality Regulations

According to Council on Environmental Quality (CEQ) regulations, federal agencies are required to "make diligent efforts to involve the public in preparing and implementing their NEPA procedures" (40 CFR 1506.6(a)). One aspect of public involvement is the public comment process. Public involvement begins with public notice of scoping meetings, followed by the public release of the Draft EIS to persons and agencies potentially interested in or affected by the proposed project and to those that have requested a copy, and any NEPA-related public hearings or meetings (40 CFR 1506.6(b)).

1.6.2 Scoping Process

By providing a means of open communication between NOAA and the public, the procedural aspects of NEPA promote better decision-making. Those having a potential interest in the proposed project, including minority, low-income, disadvantaged, and other interested groups, were notified and invited to participate in the scoping and environmental impact analysis process. The scope of this EIS was determined through public scoping, input from public agencies and officials, experience from and research for similar projects, and NEPA requirements. Per CEQ regulations, this process begins early in the EIS development and is open for input from interested parties (40 CFR 1501.7). CEQ regulations guide public participation opportunities.

As part of the scoping process, the lead agency is required to do the following:

- Invite the participation of affected federal, state, and local agencies, any affected Native American tribes, the proponent of the action, and other interested persons.
- Determine the scope and significant issues to be analyzed in depth in the EIS.

- Identify and eliminate from detailed study the issues that are not significant or that have been covered by prior environmental review.
- Indicate any public Environmental Assessments (EAs) and other EISs that are being or will be prepared that are related to but are not part of the scope of the EIS under consideration.
- Identify other environmental review and consultation requirements so the lead and cooperating agencies may prepare other required analyses and studies together with the EIS.
- Indicate the relationship between the timing of the preparation of environmental analyses and the agency's tentative planning and decision-making schedule.

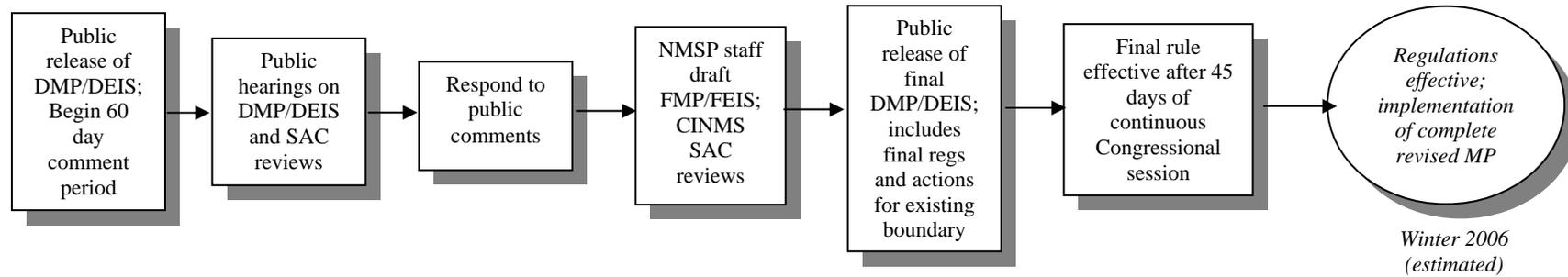
The scoping process for this EIS was initiated when NOAA published an NOI in the *Federal Register* on June 11, 1999 (Appendix A.1). As discussed above, in 1998 CINMS formed a SAC as a forum through which Sanctuary constituents can provide advice to the Sanctuary Manager, including advice on the management plan review and the EIS. From July to September 1999, seven public scoping meetings were held across San Luis Obispo, Santa Barbara, Ventura, and Los Angeles counties, as well as in Washington, D.C., followed by a public presentation of the findings in October 1999. CINMS staff received over 1,900 comments. In addition, approximately 30 public and agency meetings have been held to date and consultation letters have been mailed out to key federal, state, and local agencies and officials soliciting their input on the proposed management plan update. Documentation of the scoping process is included in Appendix A.2. The major concerns and issues expressed during the scoping process are described above in section 1.3.

1.6.3 Public Review of the Draft EIS

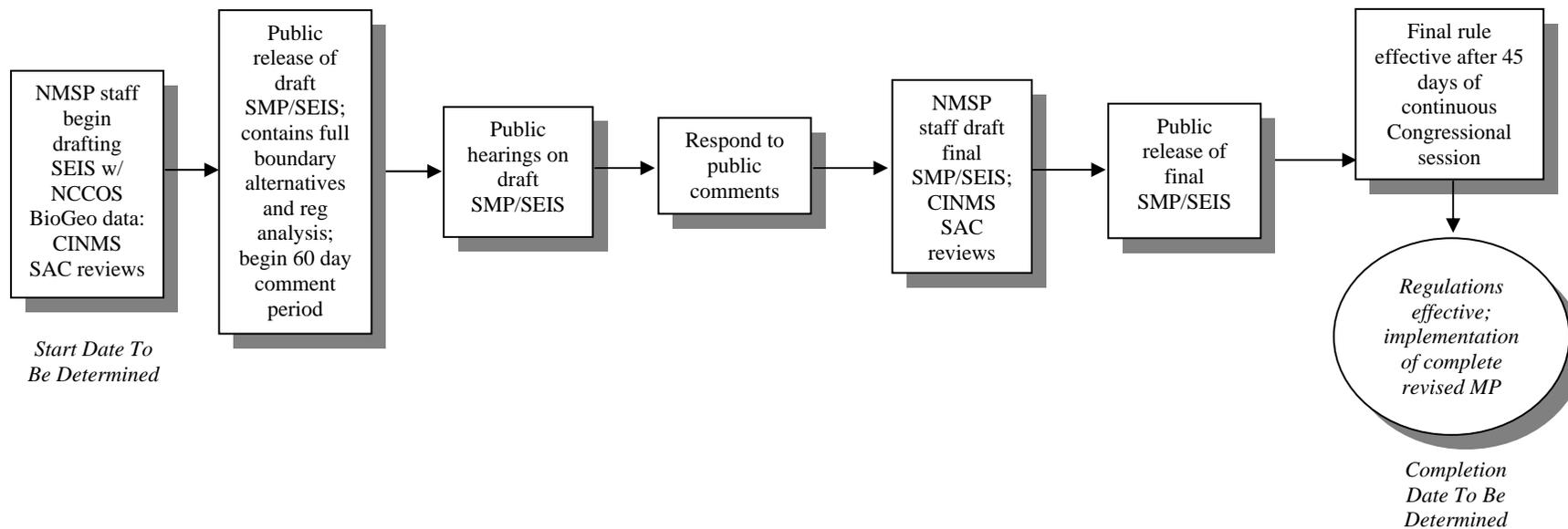
The initial scoping process allowed the public to have input on issues analyzed in this document. In addition, subsequent meetings of the SAC in 2000–2003, including special workshops on selected management plan issues (e.g., boundaries, military activities, regulations), provided numerous opportunities for the public to learn about the status of plan development and offer additional input. The next step of public involvement will be to ensure wide circulation of the DEIS and to solicit public comments on this document. CEQ regulations provide for not less than a 45-day public review period following publication of the DEIS. Availability of the DEIS will be announced in local newspapers. In addition, copies of the DEIS will be placed in the City of Santa Barbara Library (Downtown Branch), City of Lompoc Library, City of Ventura Library, City of Oxnard Library, and the library at the University of California, Santa Barbara. NOAA has compiled a mailing list of persons and agencies potentially interested in or affected by the proposed project and those who have requested a copy of the EIS. Over the summer of 2004 all individuals and agencies on the entire Sanctuary mailing list received a postcard notifying them of the pending public release of the DEIS and DMP, and soliciting their response as to whether they would like to be on the management plan review mailing list and indicate their preferred document format. The management plan review mailing list is included in Appendix F of this EIS. Public hearing(s) will be held no sooner than 30 days after the Notice of Availability is published in the *Federal Register* and at least 15 days before the end of the 45-day comment period. The steps involved in development and public review of the DEIS and DMP, leading up to development of a final management plan and final Environmental Impact Statement, are illustrated in Figure 1.6-1.

Figure 1.6-1 Development and Review Process for the Revised CINMS Management Plan and Environmental Impact Statement

Revised Management Plan/Draft Environmental Impact Statement (Status Quo Boundary)



Supplemental Management Plan/Environmental Impact Statement (Analysis of Boundary Alternatives)



1.6.4 Public Comment Management Process

During the public comment period, comments are anticipated from federal, state, and local agencies and officials; organizations; and interested individuals. These comments and corresponding responses will be included as Appendix G of the Final EIS. Oral comments presented at the public hearing(s), written statements submitted at the public hearing(s), and written statements otherwise properly submitted will be included. Each of these will be given the same consideration in the public review process.

A structured system will be used by NOAA to organize and respond to these comments. This public comment management process includes the following steps:

- Assess and consider comments both individually and collectively.
- Formulate responses, which may include incorporating the comment or otherwise addressing the comment, as appropriate, in the EIS.

NOAA will issue the Final EIS, a 30-day mandatory waiting period will occur, and then NOAA may issue its Record of Decision (ROD).

1.7 INTERAGENCY COORDINATION

NOAA has sought the input of several federal, state, and local officials and agencies in preparing this EIS. The list of these officials and agencies is provided in Chapter 7.0.

1.8 EXAMPLES OF RELATED STUDIES AND PROCESSES

Other studies and processes have been recently completed or are being conducted by federal agencies that are pertinent to marine resources in the Channel Islands region. These include:

- *Final Environmental Impact Statement/Over Seas Environmental Impact Statement, Point Mugu Sea Range* (U.S. Navy 2002).
- *California Department of Fish and Game's Final Environmental Impact Report on the Marine Protected Areas in the National Oceanic and Atmospheric Administration's Channel Islands National Marine Sanctuary* (Ugoretz 2002)
- Federal Process to Consider Establishing Marine Reserves and Conservation Areas in the CINMS
- *Draft Environmental Impact Statement, Pacific Coast Groundfish Fishery Management Plan Essential Fish Habitat Designation and Minimization of Adverse Impact* (NMFS 2005)
- Development of a new General Management Plan for the Channel Islands National Park (CINP) by the NPS.
- Environmental Assessments of granting suspensions of production or operations for nine units and one non-utilized lease in the Pacific Outer Continental Shelf (MMS 2005)

- Port of Long Beach Expansion proposed in the *Port of Long Beach Master Plan* (2003)
- BHP Billiton LNG International, Inc. and Crystal Energy separate proposals for one liquefied natural gas terminal each, offshore from Ventura and Santa Barbara counties, respectively
- Hubbs SeaWorld Research Institute proposed aquaculture facility at Platform Grace.

More information about each of the above studies and processes is included in section 4.6 of this document, which addresses the cumulative impacts of the Sanctuary's proposed action.

1.9 ORGANIZATION OF THE EIS

This Chapter (1.0) provides a background discussion of the NMSP and the proposed project at the CINMS. In addition, this chapter discusses the EIS public scoping process and lists the identified issues of concern.

Chapter 2.0 (Description of the Proposed Action and Alternatives) describes the Proposed Action, which consists of adopting revisions to existing Sanctuary regulations plus several proposed new regulations. This chapter also includes a description of one alternative to the Proposed Action and the No-Action Alternative.

Chapter 3.0 (Affected Environment) describes the project background and the existing conditions in the surrounding area to provide a baseline for assessing environmental impacts that may occur. Regional and site-specific information is provided related to the physical environment, biological environment, historical resources, and human uses (including oil and gas activities, vessel traffic and harbor activities, contaminant sources, Department of Defense and related activities, fishing, introduced species, recreation and tourism, and research and education).

Chapter 4.0 (Environmental Consequences of Alternatives) includes an evaluation of potential impacts to the physical and biological environment, historical resources, and human uses, including socioeconomic impacts that may occur as a result of implementing the Proposed Action and Alternatives. Direct, indirect, short-term, and long-term impacts are evaluated. This chapter also provides a discussion of cumulative impacts, any irreversible and irretrievable commitment of resources, the relationship between short-term uses of resources and the maintenance and enhancement of long-term productivity, unavoidable impacts, environmental justice, and growth-inducing impacts. Finally, potential mitigation measures for significant environmental impacts are discussed, if applicable.

Chapter 5.0 presents a list of other applicable federal and state law and regulations.

Chapters 6.0 through 11.0 contain References, Persons and Agencies Contacted, a List of Preparers, Acronyms and Abbreviations, and a Glossary of Terms, respectively.

Appendices to support the analyses in the EIS consist of the following:

- Appendix A—Notice of Intent and Public Scoping Process;
- Appendix B—National Marine Sanctuaries Act;
- Appendix C—Biological and Historical/Cultural Resources of the Study Area;

- Appendix D—Proposed Rule;
- Appendix E—Findings and Determinations
- Appendix F—EIS Mailing List; and
- Appendix G—Public Comments and Responses (*to be included in the Final EIS*).

2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

Introduction

This section describes various proposed regulatory changes under consideration as part of the CINMS Management Plan Review. In evaluating alternatives for analysis in the EIS, NOAA considered proposed regulatory changes appropriate for and consistent with achieving increased protection of the ecosystem, improving scientific knowledge of the area, and promoting public understanding of the value of the CINMS resources and qualities. This chapter includes a description of the screening criteria used to develop alternatives considered for the EIS evaluation process, as well as descriptions of the Proposed Action, Alternative 1, No-Action Alternative, and alternatives considered but dismissed from further evaluation.

Alternatives considered in this EIS include:

- Proposed Action: an alternative that contains updates or other changes (including additions) to the regulations that further the CINMS management;
- Alternative 1: an alternative that contains slightly more stringent regulatory language than the Proposed Action, and one new regulation on lightering; and
- No-Action Alternative: an alternative that includes the status quo regulatory scenario, along with a discussion of possible means by which the Sanctuary may augment its planned non-regulatory actions in lieu of the proposed regulatory changes.

It should be noted that the strategies and actions described in Volume I, *Draft Management Plan*, are non-regulatory in nature and not analyzed in this EIS. The DMP's Action Plans comprise activities ranging from program planning, budgeting, administrative services, mapping, vessel and aircraft operations, to basic and applied research and monitoring activities, education and outreach services, and advisory body activities. Section 6.03(c)(3)(d) of NOAA Administrative Order 216-6 specifies that these and other administrative or routine program functions that have no potential for significant environmental impacts are eligible for a categorical exclusion. The NMSP has determined that the proposed actions within the DMP individually and cumulatively have no potential for significant impact on the environment and, therefore, qualify for a categorical exclusion from NEPA's requirement for conducting an environmental assessment or preparing an EIS.

With the proposed regulatory changes, Sanctuary regulations would continue to prohibit a relatively narrow range of activities, set forth procedures and criteria for national marine sanctuary permits to conduct otherwise prohibited activities and set forth procedures for administrative appeal, and establish the Department of Defense activities that would be exempt from the regulations. More specifically, the choice of either the Proposed Action or Alternative 1 would amend the CINMS-specific regulations contained in the NMSA (15 CFR Part 922 Subpart G). A number of the regulatory amendments included in these two alternatives may not be implemented without broadening the Sanctuary's scope of authority, the portion of the Sanctuary's Designation Document (see Vol. II, Appendix D) that describes what the Sanctuary has the authority to regulate. Thus, this section also describes proposed changes to the CINMS Designation Document necessary for implementing either the Proposed Action or Alternative 1.

Screening Criteria

As part of the planning process for developing reasonable alternatives for revising the CINMS regulations, several screening criteria were considered. The criteria for reasonable alternatives included the following:

- Alternatives must satisfy the overarching goals of the NMSA, in essence, meaning they must address resource management issues, generate beneficial environmental effects, and address uses or other activities that have a negative effect (including risk) on CINMS resources.
- Alternatives should meet the goals and objectives of the designation of the CINMS.
- Alternatives should allow for the incorporation and consideration of recent and/or best available data and scientific knowledge.
- Alternatives should maximize environmental benefits while avoiding unnecessary negative socioeconomic impacts.
- Alternatives should remove obsolete requirements and increase the clarity of existing Sanctuary regulations.
- All alternatives should be feasible for the Sanctuary.
- Alternatives should, where appropriate, provide for increased consistency with other national marine sanctuaries' regulations.

This EIS has been prepared in accordance with NEPA and the CEQ implementing regulations. The EIS presents, to the decision maker and the public, information required to understand the potential environmental consequences (discussed in Vol. II, Section 4) of the Proposed Action and other alternatives.

Summary Table 2.1-1, located at the end of this chapter, compares regulatory wording changes provided in the Proposed Action and Alternative 1 with wording of the current regulations (status quo). In addition, the Proposed Action's exact regulatory language is contained in the Proposed Rule (see Vol. II, Appendix D). The following discussion provides a qualitative description and overview of the changes proposed under each alternative.

2.1 PROPOSED ACTION

The following text describes the Proposed Action, which includes the suite of regulatory changes designed to satisfy the above criteria.

2.1.1 CINMS Boundary Description Clarification

Clarifications are proposed for the description of the CINMS boundary (located at 15 CFR 922.70) to provide a more accurate and clear explanation of the existing Sanctuary boundary. One clarification would specify that the submerged lands (i.e., the lands underlying the waters of the Sanctuary) are part of the CINMS boundary. The NMSP has consistently treated submerged lands as part of national marine sanctuaries, and this is reflected in amendments to the NMSA passed in 1984 (16 U.S.C. 1432(3)).

The Sanctuary's outer boundary coordinates and description of the shoreline boundary demarcation are also proposed for clarification and technical corrections. Specifically, the boundary description is proposed to be amended to clarify that the shoreline boundary is the Mean High Water Line (MHWL) of Island shores. In addition, the list of latitude/longitude coordinates for the outer boundary at approximately six NM from Island shores is proposed to be updated with more accurate information, using the North American Datum of 1983.

Since designation the area of CINMS has been described as approximately 1252.5 square nautical miles. However, adjusting for technical corrections and using updated technologies, the CINMS area is now calculated as approximately 1243 square nautical miles. The legal description of CINMS is proposed to be updated to reflect this change. This update would not constitute a change in the geographic area of the sanctuary but rather an improvement in the estimate of its size.

The proposed revised boundary description is presented below, showing added text (underlined) and deleted text (strike-through):

The Channel Islands National Marine Sanctuary (Sanctuary) consists of an area of ~~the water off the coast of California of approximately 1243-1252.5~~ square nautical miles (NM) of coastal and ocean waters, and the submerged lands there under, off the southern coast of California. The Sanctuary boundary begins at the Mean High Water line and extends seaward to a distance of approximately six NM ~~adjacent to~~ from the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (collectively the Islands) ~~extending seaward to a distance of six NM.~~ The seaward boundary coordinates are listed in the Appendix A to this subpart.

2.1.2 Prohibition 1 (Oil and Gas)

One substantive change would be made to the existing (1982) oil and gas regulation in order to remove outdated cleanup requirements. The oil spill contingency equipment technology required in the 1982 regulation would be eliminated, since this technology has become obsolete. The terms of the current lease agreements between MMS and the lessees prescribe a mandatory oil spill contingency plan for both exploration and development that is more stringent than the Sanctuary's previous (1982) requirements. The revised regulation would continue to prohibit the exploration for, development of, or production of hydrocarbons within the Sanctuary, except pursuant to leases executed prior to March 30, 1981, and except for the laying of pipeline pursuant to exploring for, developing, or producing hydrocarbons.

The proposed revised oil and gas activity prohibition is presented below, showing added text (underlined) and deleted text (strike-through):

Exploring for, developing, ~~and or~~ or producing hydrocarbons within the Sanctuary, except pursuant to leases executed prior to March 30, 1981, and except the laying of pipeline pursuant to exploring for, developing, or producing hydrocarbons, ~~if the following oil spill contingency equipment is available at the site of such operations:~~

- (i) 1500 feet of open ocean containment boom and a boat capable of deploying the boom;
- (ii) One oil skimming device capable of open ocean use; and
- (iii) Fifteen bales of oil sorbent material, ~~and subject to all prohibitions, restrictions and conditions imposed by applicable regulations, permits, licenses or other authorizations and consistency reviews including those issued by the Department of the Interior, the Coast Guard, the Corps of Engineers, the Environmental Protection Agency and under the California Coastal Management Program and its implementing regulations.~~

Additional exceptions to this prohibition are proposed to be removed as follows, with deleted text in strike-through:

- ~~Except as may be necessary for the national defense~~
- ~~Except as may be necessary to respond to an emergency threatening life, property, or the environment~~
- ~~Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72~~

The above exceptions are not specific to the current regulation, but rather are "boilerplate" generic exceptions to the current prohibitions. The proposed revised regulations fine-tune the exceptions, as has been done in the regulations for more recently designated sanctuaries, such that only if an exception is possibly applicable is it referenced for a particular prohibition. Accordingly, removal of the above exceptions is proposed because the limited exception for hydrocarbon exploration, development, or production is already provided within the regulation itself, because exploring for, developing, and producing hydrocarbons is not envisionable as a necessary activity to respond to an emergency threatening life, property, or the environment, and because such an activity could not meet the permit criteria requirements under 15 CFR 922.48 and 922.72. Department of Defense activities are addressed elsewhere in the regulations. Further, no such exceptions have ever been sought at the CINMS.

2.1.3 Prohibition 2 (Mineral Activities)

Prohibition 2 would be an addition to the existing regulations and would prohibit exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to authorized hydrocarbon production (see Prohibition 1 above). "Mineral" is defined in the program-wide regulations as clay, stone, sand, gravel, metalliferous ore, non-metalliferous ore, or any other solid material or other matter of commercial value.

Mineral extraction activities could involve scraping the Sanctuary's seabed surface and/or excavation of pits and tunnels into the seabed. This prohibition would protect Sanctuary resources and qualities from potentially damaging effects of offshore mining activities, including but not limited to: destruction and direct smothering of the benthic biota; alteration of the seabed surface profile; potential harm to fisheries; introduction of pollutants that could cause interference with the filtering, feeding, or respiratory functions of marine organisms; loss of food sources and habitat for some species; possible lowered photosynthesis and oxygen levels; and degraded appearance of the water itself.

A prohibition on mineral activities within the Sanctuary would be consistent with the prohibition on alteration on or in the submerged lands discussed below (see 2.1.5).

There are other federal laws that deal generally with resources of the submerged lands and outer continental shelf and their development (e.g., Deep Seabed Hard Mineral Resources Act, 30 U.S.C. 1441 *et seq.*; Submerged Lands Act, 43 U.S.C. 1301 *et seq.*; Outer Continental Shelf Lands Act, 43 U.S.C. 1331 *et seq.*). These laws require consideration of environmental impacts prior to issuance of resource development permits, and in some cases require monitoring of environmental impacts associated with any resource development activities. However, the Sanctuary's proposed new regulation to prohibit exploring for, developing or producing minerals within the Sanctuary differs from other federal regulations pertaining to resources on or in submerged lands and the continental shelf in that its purpose is to protect such resources within the Channel Islands National Marine Sanctuary.

The proposed new mineral activity prohibition is presented below:

Exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to hydrocarbon production allowed.

2.1.4 Prohibition 3 (Discharging or Depositing)

Prohibition 3 would amend the existing (1982) regulation that prohibits discharging or depositing any material or other matter in the Sanctuary, with certain exceptions. This prohibition is necessary to protect Sanctuary resources and qualities from the effects of pollutants and other materials. The proposed changes to the existing regulation primarily serve the purposes of achieving increased clarity, providing more consistency with other more recently designated national marine sanctuaries' regulatory language, and helping to protect Sanctuary resources from negative influences originating outside CINMS boundaries.

The proposed revised regulation would prohibit discharging or depositing from within or into the Sanctuary any material or other matter, with a revised list of exceptions. The revised prohibition and revised exceptions would be as follows, with deleted text shown in strike-through and added text shown in underline:

Discharging or depositing from within or into the Sanctuary any material or other matter except:

- Fish, ~~or fish parts, and~~ or chumming materials (bait) used in or resulting from lawful fishing activity within the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity within the Sanctuary;
- Biodegradable effluents incidental to vessel ~~use of the Sanctuary~~ and generated by an operable Type I or II marine sanitation devices (U.S. Coast Guard classification) approved in accordance with section 312 of the Federal Water Pollution Control Act, as amended, (FWPCA), 33 U.S.C. 1321 et seq. Vessel operators must lock all marine sanitation devices in a manner that prevents discharge of untreated sewage;
- Biodegradable matter from a vessel resulting from deck wash down, vessel engine cooling water, or graywater as defined by section 312 of the FWPCA;
- ~~Meals on board vessels;~~
- Vessel engine or generator exhaust;
- Effluents routinely and necessarily discharged or deposited incidental to hydrocarbon exploration, development, or production ~~and exploitation activities~~ allowed under Prohibition 1 (see above);
- Discharges allowed under section 312(n) of the FWPCA.

These proposed revisions contain language improvements and clarifications including: that the regulation applies to discharges and deposits “from within or into the Sanctuary”; that the exception for fish, fish parts, or chumming materials (bait) applies during the conduct of lawful fishing activity within the Sanctuary; and that the exception for biodegradable effluent discharges from marine sanitation devices applies only to operable Type I or II marine sanitation devices approved by the United States Coast Guard

in accordance with the Federal Water Pollution Control Act. These clarifications and other changes are explained below.

The specification that this regulation applies to discharges or deposits “from within or into the sanctuary” seeks to clarify that not only discharges and deposits originating in the Sanctuary (including from vessels in the Sanctuary), but also discharges and deposits from aircraft above the Sanctuary, from docks and piers extending over the Sanctuary, and from cliffs and other lands adjacent to the Sanctuary, for example, are included in the prohibition.

The specification that the exception for depositing fish, fish parts, or chumming material (bait) would only pertain to lawful fishing activities to clarify that it does not include chumming for purposes of unlawful or non-fishing activities and that it does not include discharge or deposit not occurring during lawful fishing activity and to dumping of fish wastes. Without this clarification the Sanctuary may be vulnerable to a possible increase in chumming practices for recreational or other purposes not associated with lawful fishing activities.

The changes in wording with regard to the exception for vessel sewage discharge (biodegradable effluent) from a marine sanitation device are intended to provide greater clarity and specificity regarding the original intent of the regulation. Although the existing regulation requires that vessel wastes be “generated by a marine sanitation device” and this is meant to prohibit the dumping of untreated sewage into the Sanctuary, the proposed new language provides greater clarity with regard to this by specifying that such discharges are only allowed if generated by Type I or II marine sanitation devices. Type I and II marine sanitation devices treat wastes, while a Type III marine sanitation device does not.

Meals from vessels would no longer be an exception from the prohibition since they are considered marine debris; instead they should be deposited on land or outside the Sanctuary’s seaward boundary, in accordance with other applicable laws. Without this revision existing Sanctuary regulations would continue to allow discharging or depositing food waste within the Sanctuary despite the fact that this conflicts with the more recent (1987) implementing regulations of the Marine Plastic Pollution Research and Control Act (MPPRCA), 33 CFR Part 151 *et seq.*, which prohibits such discharges from 0 to 3 NM from shore, and permits them from 3 to 12 NM from shore only if the food waste has been ground to less than 1 inch. Since the revised regulation would prohibit discharge of food wastes in the entire Sanctuary, Sanctuary regulations would be consistent with the MPPRCA prohibition on discharge of food wastes from 0-3 NM offshore, and would augment the protection afforded by the MPPRCA for the 3-6 NM offshore zone of the Sanctuary by prohibiting discharge of food wastes regardless of whether or not they have been ground to within one inch.

Finally, additional clarity and specificity have been added to the revised exceptions for deck wash down, cooling water, and engine exhaust. These revisions clarify the intent of the exceptions and that they apply strictly to discharges and deposits incidental to vessel use within the Sanctuary.

The revised discharge regulation would also be amended to include a new prohibition on discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality, except the exceptions listed above and fish, fish parts, or chumming materials (bait) used in or resulting from lawful fishing activity beyond the boundary of the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity there. “Sanctuary resource” is defined at 15 CFR 922.3 as “any living or non-living resource of a national marine sanctuary that contributes to the conservation, recreational, ecological, historical, research, educational, or aesthetic value of the Sanctuary, including, but not limited to, the substratum of the area of the Sanctuary, other submerged features and the surrounding seabed, carbonate rock, corals

and other bottom formations, coralline algae and other marine plants and algae, marine invertebrates, brine-seep biota, phytoplankton, zooplankton, fish, seabirds, sea turtles and other marine reptiles, marine mammals and historical resources.” “Sanctuary quality” is defined at 15 CFR 922.3 as “any of those ambient conditions, physical-chemical characteristics and natural processes, the maintenance of which is essential to the ecological health of the Sanctuary, including, but not limited to, water quality, sediment quality and air quality.” This revised regulation would apply to situations such as a hazardous substance spill that originates from beyond the boundary of the Sanctuary but subsequently enters and injures CINMS resources.

This modification would provide consistency with other more recently designated sanctuaries' regulatory language. For example, this prohibition is found in the regulations for Monterey Bay, Flower Garden Banks, Stellwagen Bank, Olympic Coast, and the Florida Keys national marine sanctuaries.

While other federal laws regulate dumping of particular types of waste in various regions of U.S. waters, the proposed regulation is unique in its recognition that regardless of the point of discharge or deposit, material or other matter discharged or deposited in the surrounding fluid ocean environment may drift into the Sanctuary and injure CINMS' nationally significant resources and qualities. The proposed regulatory prohibition would afford a legal deterrent through applicability of NMSA civil penalties, and help to protect Sanctuary resources from negative influences outside CINMS boundaries.

Additional cross-cutting exceptions, which apply to multiple regulations in the proposed action, are applicable to this proposed revised regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as ~~may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR secs. 922.48 and 922.723.
- Except ~~as may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment.
- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

2.1.5 Prohibition 4 (Altering the Seabed)

The intent of this revised prohibition is to preclude drilling into, dredging, or otherwise altering the submerged lands (the “submerged lands” language is a proposed substitution—see Section 2.1.1 above) of the Sanctuary; or constructing or placing any structure, material, or other matter on or in the submerged lands of the Sanctuary, except as incidental to and necessary to:

- anchor a vessel;
- install an authorized navigational aid;
- conduct lawful fishing activity;
- lay pipeline pursuant to exploring for, developing, or producing hydrocarbons (see Prohibition 1); or
- explore for, develop, or produce hydrocarbons as allowed (under Prohibition 1).

The proposed revised seabed alternation prohibition is presented below, showing added text (underlined) and deleted text (strike-through):

~~Except in connection with the laying of any pipeline as allowed by paragraph (a)(1) of this section, within 2 NM of any Island: (ii) Drilling into through the seabed, (iii) Dredging, or otherwise altering the seabed-submerged lands of the Sanctuary in any way, other than; (i) or C~~constructing or placing any structure other than a navigation aid, material, or other matter on or in the submerged lands of the Sanctuary, except as incidental to and necessary to:

~~(A)(i) To anchor a vessels;~~

(ii) Install an authorized navigational aid;

~~(B)(iii) To bottom trawl from a commercial fishing vessel~~Conduct lawful fishing activity;

(iv) Lay pipeline pursuant to exploring for, developing, or producing hydrocarbons; or

(v) Explore for, develop, or produce hydrocarbons as allowed by subparagraph (a)(1) of this section.

The most substantive proposed revision to the existing (1982) regulation is its applicability to the entire Sanctuary, rather than merely to the first 2 NM from Island shores as is currently specified. Expanding the geographic extent of this prohibition to the entire Sanctuary area would ensure protection of its diverse accentuated bottom relief, varied substrate and benthic habitats.

Other federal law (e.g., the Rivers and Harbors Act, 33 U.S.C. 401 *et seq.*; and the Wreck Act, 33 U.S.C. 409 *et seq.*) prohibit unauthorized deposits upon, and placement of structures on submerged lands with the intent of prohibiting potential obstructions to navigation. Unlike these other acts, this proposed revised regulation focuses on place-based protection of submerged lands within the Sanctuary and the nationally significant resources on or in them. A further distinction is that the proposed revised regulation protects the submerged lands regardless of whether or not an obstruction to navigation is at issue.

Proposed revisions to this regulation would also replace the term “seabed” with “submerged lands,” to be consistent with the NMSA, and consistent with regulations at more recently designated sanctuaries. Another proposed change to this regulation would modify the exception for “bottom trawling from a commercial vessel” to provide an exception for activities incidental and necessary to “conduct lawful fishing activity.” This broadening of the exception would encompass other bottom-touching gear types, such as pots and traps, which the drafters of the original regulations apparently did not realize could alter the seabed. This proposed change would thus remove any uncertainty about the existing regulation's applicability to such gear types.

Additional cross-cutting exceptions, which apply to multiple regulations in the proposed action, are applicable to this proposed revised regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as ~~may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR secs. 922.48 and 922.723.
- Except as ~~may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment.
- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

2.1.6 Prohibition 5 (Abandoning)

This new regulation would prohibit abandoning, by which is meant leaving without intent to remove, any structure, material, or other matter on or in the submerged lands of the Sanctuary. This proposed regulation would add greater specificity to the types of seabed disturbances currently not allowed by adding “abandoning” structures, material, or other matter as a prohibition. This change is important to protect the CIMNS from debris abandoned by Sanctuary users, such as the possibility of a wrecked vessel containing hazardous materials being left in place, or seabed research equipment not being removed after its permitted use is concluded.

Additional cross-cutting exceptions, which apply to multiple regulations in the proposed action, are applicable to this proposed revised regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as in accordance with the scope, purpose, terms and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.73.
- Except for an activity necessary to respond to an emergency threatening life, property, or the environment.
- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

If a permit has been obtained from the CINMS (pursuant to 15 CFR 922.48 and 922.73 of the NMSA), the terms of such a permit would likely require the eventual removal of such items. Under appropriate circumstances, such as an emergency threatening loss of life or property, the emergency exception could allow for temporary abandonment of an item on the seafloor. For example, this exception could allow for temporary abandonment of an anchor in the event of a boating emergency, or of research or photographic equipment during a dive emergency. However, the responsible party would subsequently have an obligation to remove these items.

The proposed regulation, if adopted, would be the only federal regulation to afford all Sanctuary submerged lands and associated resources complete protection from abandoned structures, material or other matter. The existing Sanctuary regulation that prohibits disturbance of the seabed offers partial protection from abandonment of structures, material or other matter, in so far as it prohibits such activities that disturb the seabed. However, the existing seabed protection regulation only provides protection from disturbance to the seabed from 0 to 2 NM offshore of the Islands, and does not expressly prohibit abandoning any structure, material, or other matter thereupon. National Park Service regulations (36 CFR. 2.22(a)(1)) prohibit abandoning property within units of the National Park System, and as such apply from 0-1 NM offshore of the Islands. As noted under prohibition 4 above, other federal regulations (e.g., the Rivers and Harbors Act, 33 U.S.C. 401 *et seq.*; and the Wreck Act, 33 U.S.C. 409 *et seq.*) prohibit unauthorized deposits upon, and placement of structures on submerged lands with the intent of prohibiting potential obstructions to navigation. Unlike these other acts, this proposed regulation focuses on place-based protection of submerged lands within the Sanctuary and the nationally significant resources on or in them. A further distinction is that the proposed regulation protects the sea floor regardless of whether or not an obstruction to navigation is at issue. Thus, only the proposed regulation offers express protection against abandonment of structures, material or other matter throughout the entire Sanctuary area, and provides added deterrence in the form of NMSA-authorized civil penalties of up to \$130,000 per incident, per day.

The proposed regulation would also be consistent with the U.S. Ocean Action Plan: The Bush Administration's Response to the U.S. Commission on Ocean Policy (2004). In this Action Plan the Administration acknowledges the harmful effects marine debris has on valuable marine resources, and calls for the re-establishment of the Interagency Marine Debris Coordinating Committee (re-established in December 2004), of which NOAA is a member.

2.1.7 Prohibition 6 (Nearshore Operation of Vessels)

This revised regulation would prohibit the operation—within 1 NM of an Island—of:

- Any vessel engaged in the trade of carrying cargo, including but not limited to tankers and other bulk carriers and barges;
- Any vessel engaged in the trade of servicing offshore installations; and
- Any vessel of 300 registered gross tons or more.

The two existing exceptions to this prohibition would be fishing and kelp harvesting vessels, and vessels transporting persons or supplies to or from an Island.

The existing (1982) regulation allows for the legal approach of all vessels that do not fall within the first two categories listed above, regardless of their size, such as cruise ships, privately owned vessels, charter vessels, vessels owned by educational, research or restoration NGOs, and salvage vessels. The proposed regulation differs from the current regulation in that it adds the prohibition regarding vessels of 300 gross tons or more. The intent of this additional prohibition is to protect the sensitive nearshore areas of the islands, including kelp forests, rocky reefs, and other areas, from the potential impacts of large-vessel groundings or collisions, including, but not limited to, cruise ships. The NMSP developed the proposed modified prohibition since it more directly addresses the Sanctuary's concern that very large vessels, regardless of their purpose, not approach and put at risk sensitive nearshore areas of the Sanctuary.

Additional cross-cutting exceptions, which apply to multiple regulations in the proposed action, are applicable to this proposed revised regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as ~~may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR secs. 922.48 and 922.723.
- Except as ~~may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment.
- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

These exceptions could allow, for example, a large research vessel to approach within 1 NM of the Islands if a permit for this activity has been obtained from the CINMS (pursuant to 15 CFR 922.48 and 922.73 of the NMSA).

2.1.8 Prohibition 7 (Disturbing a Seabird or Marine Mammal by Aircraft Overflight)

This revised regulation prohibits disturbance of a seabird or marine mammal by flying a motorized aircraft at less than 1,000 feet over the waters within 1 NM of any Island, except if allowed under Prohibition 9 (see below), to engage in kelp bed surveys, or to transport persons or supplies to or from an Island.

The proposed revised regulation is presented below, showing added text (underlined) and deleted text (strike-through):

Disturbing a seabirds or marine mammals by flying motorized aircraft at less than 1000 feet over the waters within one NM of any Island, except, if allowed under subparagraph (a)(9) of this section:

- ~~(i) For enforcement purposes;~~
- ~~(ii) to engage in kelp bed surveys; or~~
- ~~(iii) to transport persons or supplies to or from an Island.~~

This modification would not result in a regulation substantially different from the corresponding existing regulation. One difference is that this proposed modified regulation includes a new clause to emphasize that the exceptions to this regulation do not override the obligation to comply with proposed Prohibition 9 (taking a marine mammal, seabird, or sea turtle).

Additional cross-cutting exceptions, which apply to multiple regulations in the proposed action, are applicable to this proposed revised regulation. For example, specified aircraft overflight likely to cause marine mammal or seabird disturbance under 1,000 feet near the Islands could be allowed if the necessary permit(s) have been obtained from the CINMS (pursuant to 15 CFR 922.48 and 922.73 of the NMSA), and any other relevant state or federal authorities.

These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as ~~may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR secs. 922.48 and 922.723.
- Except as ~~may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment.
- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

2.1.9 Prohibition 8 (Moving, Removing, Possessing or Injuring a Sanctuary Historical Resource)

This revised regulation would prohibit moving, removing, injuring, or possessing, or attempting to move, remove, injure, or possess a CINMS historical resource. Revisions to the existing (1982) regulation include adding “moving” and “possessing”; replacing “damage” with “injure,” a term defined in the program-wide regulations (15 CFR 922.3); and adding “attempting” to move, remove, injure, or possess as a prohibition. In addition, the proposed regulation would also replace “historical or cultural resource” with “Sanctuary historical resource” to be consistent with regulatory language used at several other more-

recently designated national marine sanctuaries (see NMSP definition of “historical resource” at 15 CFR 922.3).

The proposed revised prohibition is presented below, showing added text (underlined) and deleted text (strike-through):

Moving, removing, injuring, or possessing, or attempting to move, remove, injure, or possess ~~or damaging any a Sanctuary~~ historical ~~or cultural~~ resource.

Cross-cutting exceptions, which apply to multiple regulations in the proposed action, are applicable to this proposed revised regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as ~~may be permitted by the Director~~ in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR secs. 922.48 and 922.723.
- Except as ~~may be~~ for an activity necessary to respond to an emergency threatening life, property, or the environment.
- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

The intent of this modification is to provide added protection to the fragile, finite, and non-renewable nationally significant historical resources of the Sanctuary so they may be studied, and so appropriate information about them may be made available for the benefit of the public. While the Antiquities Act (16 U.S.C. 431 *et seq.*), the Archaeological Resources Protection Act (16 U.S.C. 470aa *et seq.*), National Park Service Regulations (36 CFR Part 2) and Channel Islands National Park regulations (36 CFR 7.84) collectively prohibit appropriating or possessing, excavating, destroying, injuring, removing, damaging, altering, defacing, displacing, and tampering with cultural, archeological, paleontological and historical resources, ruins or monuments, abandoned water or airborne craft (and cargo pertaining thereto), several aspects of the proposed revised regulation provide unique protection to historical resources of the Sanctuary. Among these unique protections are: special place-based protection to nationally significant historical resources found solely within the Sanctuary, protection afforded to such resources within the entire Sanctuary area (whereas National Park regulations only apply from 0 to 1 NM offshore from the islands), prohibition of *attempting* to move, remove, injure, or possess any Sanctuary historical resource, and civil penalties of up to \$130,000 per incident, per day. This site-specific attention and regulatory authority is seen by the NMSP as essential, and furthermore in need of the slight changes proposed above in order to increase clarity and effectiveness.

2.1.10 Prohibition 9 (Taking a Marine Mammal, Sea Turtle, or Seabird)

This new regulation would prohibit taking any marine mammal, sea turtle, or seabird within or above the CINMS, except as expressly authorized under the Marine Mammal Protection Act, as amended (MMPA), 16 U.S.C. 1361 *et seq.*; Endangered Species Act, as amended (ESA), 16 U.S.C. 1531 *et seq.*; Migratory Bird Treaty Act, as amended (MBTA), 16 U.S.C. 703 *et seq.*; or any regulation, as amended, promulgated under one of these acts. Per the NMSP program-wide regulations, “take” or “taking” means: (1) for any marine mammal, sea turtle, or seabird listed as either endangered or threatened pursuant to the ESA, to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect or injure, or to attempt to engage in any such conduct; (2) for any other marine mammal, sea turtle, or seabird, to harass, hunt, capture, kill, collect or injure, or to attempt to engage in any such conduct. For the purposes of both (1)

and (2) of this definition, this includes, but is not limited to, collecting any dead or injured marine mammal, sea turtle, or seabird, or any part thereof; restraining or detaining any marine mammal, sea turtle, or seabird, or any part thereof, no matter how temporarily; tagging any sea turtle, marine mammal, or seabird; operating a vessel or aircraft or any other act that results in the disturbance or molestation of any marine mammal, sea turtle, or seabird (15 CFR 922.3).

Additional cross-cutting exceptions, which apply to multiple regulations in the proposed action, are applicable to this proposed regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as in accordance with the scope, purpose, terms and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.73.
- Except for an activity necessary to respond to an emergency threatening life, property, or the environment.
- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

The intent of this regulation is to bring a special focus to protection of the diverse and vital marine mammal and seabird populations found within the CINMS, without complicating existing authorization and permitting procedures and requirements. The MMPA, ESA, and MBTA, and implementing regulations associated with each, prohibit take of certain species unless authorized under certain circumstances. The Sanctuary's proposed regulation would not apply if an activity (including a federally or state-approved fishery) that does or might cause take of marine mammals, seabirds or sea turtles has been expressly authorized to do so under the MMPA, ESA, or MBTA or any implementing regulation promulgated under these acts. With this proposed regulation, if NMFS or the USFWS issues a permit for the take of a marine mammal, seabird, or sea turtle, it would not be regulated by the NMSP and therefore would not require a permit from the Sanctuary unless the activity would also violate another Sanctuary regulation. Unlike the MMPA, ESA, and MBTA, and their implementing regulations, the proposed regulation places special emphasis on providing added protection to the marine mammal, sea turtle and seabird populations of the CINMS. Such area-specific focus is seen by the NMSP as important and complementary to other resource protection agencies, especially given that other federal and state authorities must spread limited resources over much wider geographic areas. In addition, this regulation would provide a greater deterrent per the maximum civil penalty provided under the NMSA (up to \$130,000 per incident, per day) than the penalties provided by the MMPA, ESA and MBTA. Further, the prohibition would cover all marine mammals, sea turtles, and sea birds within or above the Sanctuary. This regulation would be consistent with regulations at the more recently designated national marine sanctuaries established at Monterey Bay, Stellwagen Bank, Olympic Coast, and the Florida Keys.

2.1.11 Prohibition 10 (Possessing a Marine Mammal, Sea Turtle, or Seabird)

This new regulation would prohibit possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as expressly authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA.

Additional cross-cutting exceptions, which apply to multiple regulations in the proposed action, are applicable to this proposed regulation. These exceptions are presented below, using added text

(underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as in accordance with the scope, purpose, terms and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.73.
- Except for an activity necessary to respond to an emergency threatening life or the environment.
- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

Similar to Prohibition 9, this proposed regulation would serve to provide a greater deterrent against violations of existing laws protecting marine mammals, seabirds and sea turtles. The proposed regulation differs from the MMPA, ESA and MBTA in its special focus on providing added protection to the marine mammal, seabird, and sea turtle populations of the CINMS. Such area-specific focus is seen by the NMSP as important and complementary to other resource protection agencies, especially given that other federal and state authorities must spread limited resources over much wider geographic areas. In addition, this regulation would provide a greater deterrent per the maximum civil penalty provided under the NMSA (up to \$130,000 per incident, per day) than the penalties provided by the MMPA, ESA and MBTA. This proposed regulation would be consistent with more recent regulations adopted by other national marine sanctuaries and would enhance protection provided by Prohibition 9 (see above).

With this proposed regulation, if NMFS or the USFWS issues a permit for the possession of a marine mammal, seabird, or sea turtle, it would not be regulated by the NMSP and therefore would not require a permit from the Sanctuary unless the activity would also violate another Sanctuary regulation.

2.1.12 Prohibition 11 (Tampering with Signs)

This new regulation would prohibit marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary.

Additional cross-cutting exceptions, which apply to multiple regulations in the proposed action, are applicable to this proposed regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except for an activity necessary to respond to an emergency threatening life, property, or the environment.
- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

This prohibition is designed to protect Sanctuary property used for signage purposes, including demarcation, enforcement, conveying regulatory information, education, outreach, and research. This new proposed regulation would be consistent with some other national marine sanctuaries' regulations.

2.1.13 Prohibition 12 (Releasing an Introduced Species)

This new regulation would prohibit introducing or otherwise releasing an introduced species from within or into the Sanctuary, except striped bass (*Roccus saxatilis*) released during catch and release fishing activity. A proposed regulatory definition for "Introduced species" is: (1) species (including but not

limited to any of its biological matter capable of propagation) that are non-native to the ecosystem protected by the Sanctuary; or (2) any organism into which genetic matter from another species has been transferred in order that the host organism acquires the genetic traits of the transferred genes.

Additional cross-cutting exceptions, which apply to multiple regulations in the proposed action, are applicable to this proposed regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except for an activity necessary to respond to an emergency threatening life, property, or the environment.
- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

The intent of the prohibition is to prevent injury to Sanctuary resources and qualities, and protect CINMS ecosystem biodiversity and function, all of which are put at risk by introduced species being released or otherwise introduced into the Sanctuary. Introduced species have negatively impacted over 45 percent of listed threatened or endangered species in the United States; the establishment of introduced species is second to habitat loss as the major threat to native species diversity (Government Accounting Office 2002; Kimball 2001; Wilcove *et al.* 1998). At least 500 non-native species have invaded marine and estuarine habitats within the U.S. (deRivera *et al.* 2005). A 2005 report on non-native species monitoring in west coast national marine sanctuaries and National Estuarine Research Reserves identified 16 non-native sessile invertebrate species in the Channel Islands region that were originally introduced elsewhere on the west coast through vectors including shipping (hull-fouling), fisheries (accidental introduction via oysters), and ballast water (deRivera *et al.* 2005). This proposed regulation is also being planned at California's Monterey Bay, Cordell Bank, and Gulf of the Farallones National Marine Sanctuaries and is based on a comparable prohibition in place at the Florida Keys National Marine Sanctuary.

A discussion of the type of impacts introduced species can have on native coastal marine species is presented at Section 3.5.5.

Several existing federal and California laws and regulations address introduced species, but none comprehensively prohibit introducing or otherwise releasing introduced species (as defined above) into all waters within the Sanctuary. The Nonindigenous Aquatic Nuisance Prevention and Control Act, as amended by the National Invasive Species Act, (16 U.S.C. 4701 *et seq.*) focuses on preventing the introduction and spread of aquatic nuisance species through ballast water, and requires ballast water management programs for various federal departments. The Lacey Act (16 U.S.C. 3371 *et seq.*) prohibits the trafficking and possession of any wildlife, fish, or plant taken in violation of domestic, foreign, state, or Indian tribal law. National Park Service regulations in effect at Channel Islands National Park (whose seaward boundary extends to 1 NM offshore from the islands) prohibit introducing wildlife, fish or plants, including their reproductive bodies, into a Park area ecosystem (36 CFR 2.1(a)(2)). California law (Fish and Game Code 15007) prohibits spawning, incubating or cultivating transgenic and exotic species (as defined in the section) in California marine waters (0 to 3 NM offshore). The proposed prohibition differs from these other laws and regulations in its: place-based protections specifically for CINMS, prohibition of transgenic species introductions in both state and federal waters of the Sanctuary, and prohibition of introducing or otherwise releasing species beyond the 1 NM offshore Channel Islands National Park boundary. Furthermore, the proposed Sanctuary regulation establishes a deterrent against intentional and unintentional releases or other introductions of introduced species into the Sanctuary through civil penalty (up to \$130,000 per incident, per day) under the NMSA.

The proposed prohibition includes an exception for striped bass (*Morone saxatilis*) released during catch and release fishing activity. Striped bass were intentionally introduced in California in 1879, and in 1980 the California Department of Fish and Game initiated a striped bass hatchery program to support the striped bass sport fishery, which according to the California Department of Fish and Game is one of the most important fisheries on the Pacific Coast. The California Department of Fish and Game manages the striped bass fishery through a Striped Bass Management Conservation Plan. (Leet *et al.* 2001) The proposed regulation is intended to acknowledge that striped bass are the focus of an established state-managed sport fishery and since they consequently may be caught within the Sanctuary make an exception for striped bass released during catch and release fishing activity.

2.1.14 Prohibition 13 (Operation of Motorized Personal Watercraft)

This new regulation would prohibit operating a motorized personal watercraft (MPWC) within waters of the Channel Islands National Park (CINP or Park), established by 16 U.S.C. 410(ff), which states that the boundaries of Channel Islands National Park include San Miguel and Prince Islands, Santa Rosa, Santa Cruz, Anacapa and Santa Barbara Islands, including the rocks, islets, submerged lands, and waters within one nautical mile of each island, as depicted on the map entitled, "Proposed Channel Islands National Park" numbered 159-20,008 and dated April 1979. The regulation, including the definition, would mirror the National Park Service regulation (36 CFR sec 1.4(a)): "motorized personal watercraft" refers to a vessel, usually less than 16 feet in length, which uses an inboard, internal combustion engine powering a water jet pump as its primary source of propulsion. The vessel is intended to be operated by a person or persons sitting, standing or kneeling on the vessel, rather than within the confines of the hull. The length is measured from end to end over the deck excluding sheer, meaning a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline. Bow sprits, bumpkins, rudders, outboard motor brackets, and similar fittings or attachments, are not included in the measurement. Length is stated in feet and inches."

Several cross-cutting exceptions, which apply to multiple regulations in the proposed action, are applicable to this proposed regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except as in accordance with the scope, purpose, terms and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.73.
- Except for an activity necessary to respond to an emergency threatening life or the environment.
- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

This proposed regulation would mirror an existing National Park Service regulation in place at the CINP, in which use of motorized personal watercraft is banned within CINP waters. The National Park Service and CINP have indicated their support for this proposed Sanctuary prohibition as it would be consistent with the National Park Service ban, and as it would provide added enforcement benefits, for example, higher penalties and those penalties would be levied through an administrative (civil) rather than a criminal process. CINP has observed an increase in use of motorized personal watercraft within the Park over the last several years, and Park staff issue several dozen warnings per year for violation of this ban (Fitzgerald 2005). In combination with the National Park Service ban, this proposed regulation is intended to provide an added deterrence for purposes of ensuring protection of Sanctuary wildlife and habitats.

MPWCs operate in a manner unique among recreational vehicles and pose a threat to wildlife. Their shallow draft enables them to penetrate areas not available to conventional motorized watercraft (NPS 2000, MOCZM 2002). The high speed and maneuverability of MPWCs, along with the tendency to operate them near the shore and in a repeated fashion within a confined area, results in recurring disturbance to animals and habitats (Rodgers and Smith 1997, Snow 1989). Studies have shown that the use of MPWCs in nearshore areas can increase flushing rates, reduce nesting success of certain bird species, impact spawning fish, and reduce fishing success (Burger 1998, Snow 1989). The National Park Service (2000, 2004) identified several of these impacts along with interruption of normal activity, avoidance and displacement, loss of habitat use, interference with movement, direct mortality, interference with courtship, alteration of behavior, change in community structure, elevated noise levels, and damage to aquatic vegetation. Further, offshore marine mammals or surfacing birds may be unaware of the presence of these vehicles due to their low frequency sound; when the inability to detect the vehicles is combined with their high speed and rapid and unpredictable movements, both animals and operators are at risk (Snow 1989).

Water quality concerns related to use of MPWC, and in particular those with two-stroke engines, include discharge of oil and gas, and air pollutants. MPWC using two-stroke engines may discharge as much as 25 percent of their gas and oil emissions directly into the water (NPS 2000). Two-stroke engines may also expel lubricating oil as part of their exhaust, and emit air pollutants such as volatile organic compounds, nitrogen oxides, particulate matter, and carbon monoxide (NPS 2004).

A review of information currently available from MPWC manufacturers indicates that they have made efforts to reduce emissions and noise through use of more efficient four-stroke engines as well as other technology (e.g., Bombardier Recreational Products, Inc. 2005a, 2005b; Personal Watercraft Industry Association 2005). However, it is not clear that such improvements have rendered emission and noise impacts due to motorized personal watercraft insignificant. While industry sponsored studies indicate that MPWCs are no louder than similar motorized vessels under analogous conditions, other studies indicate that because MPWCs travel repeatedly in the same area, continually leaving and reentering the water, they create rapid cycles of noise that disturb humans and wildlife (MOCZM 2002). Industry improvements in noise and other emissions do not address impacts associated with the high speed, maneuverability, shallow draft, and nearshore operation of MPWC.

The area within one NM of island shores experiences the greatest visitor use and impact to sensitive nearshore Sanctuary marine resources. The proposed regulation would serve as an added deterrent to illegal motorized personal watercraft use within the nearshore area and other waters of the Channel Islands National Park, and would carry a maximum civil penalty of \$130,000 per incident, per day.

2.1.15 Department of Defense Military Activities

This proposed revised regulation would update, clarify and otherwise modify the existing exemption for Department of Defense military activities. Specifically, the regulation would provide that prohibitions 3 through 14 above do not apply to military activities carried out by the Department of Defense as of the effective date of the new and revised regulations and specifically identified in Section 3.5.9 of this DEIS, entitled "Department of Defense Activities" ("pre-existing activities"). Other military activities carried out by DOD may be exempted by the Director after consultation between the Director and DOD.

This proposed revised regulation would also state that a military activity carried out by DOD as of the effective date of the new and revised Sanctuary regulations, and specifically identified in the section entitled "Department of Defense Activities" of the FMP/FEIS, is not considered a pre-existing activity if:

- the activity is modified in such a way that requires the preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act, 42 U.S.C. 4321 et seq., relevant to a Sanctuary resource or quality;
- the activity is modified, including but not limited to changes in location or frequency, in such a way that its possible adverse effects on Sanctuary resources or qualities are significantly greater than previously considered for the unmodified activity;
- the activity is modified, including but not limited to changes in location or frequency, in such a way that its possible adverse effects on Sanctuary resources or qualities are significantly different in manner than previously considered for the unmodified activity; or
- there are new circumstances or information relevant to a Sanctuary resource or quality that were not addressed in the FEIS/MP.

Consistent with the NMSA, this proposed revised regulation also provides that in the event of destruction of, loss of, or injury to a Sanctuary resource or quality resulting from an incident, including, but not limited to, discharges, deposits, and groundings caused by a Department of Defense activity, the Department of Defense, in coordination with the Director, must promptly prevent and mitigate further damage and must restore or replace the Sanctuary resource or quality in a manner approved by the Director. In addition, this proposed regulation would require that all Department of Defense activities be carried out in a manner that avoids to the maximum extent practicable any adverse impacts on Sanctuary resources and qualities.

2.1.16 Regulation on Permit Procedures and Issuance Criteria

Proposed permitting criteria and procedures for CINMS are more thoroughly and clearly described than the existing regulatory language on permits, introduce some new express requirements for both permittee and CINMS designed to ensure that permitted projects are appropriate for the Sanctuary, and offer additional flexibility for handling various permitting situations that could arise. Below are the proposed revisions to the procedures and issuance criteria for obtaining a permit from the CINMS to conduct an activity otherwise prohibited in the Sanctuary, with deleted text shown in strike-through and added text underlined. Following the proposed revisions is a textual explanation of the difference between the existing and proposed revised permit regulations, as well as an explanation of the reasons for and intent of the proposed revisions.

Proposed revisions to Sanctuary permit procedures and issuance criteria:

- (a) A person may conduct an activity prohibited by 922.72(a)(3) through (10) and (a)(13) if such activity is specifically authorized by, and conducted in accordance with the scope, purpose, terms, and conditions of, a permit issued under 922.48 and this section. ~~Any person in possession of a valid permit issued by the Director in accordance with this section and 922.48 may conduct any activity in the Sanctuary prohibited under 922.71 if such activity is either:~~
- (1) ~~Research related to the resources of the Sanctuary,~~
 - (2) ~~To further the educational value of the Sanctuary; or~~
 - (3) ~~For salvage or recovery operations.~~

- (b) The Director, at his or her sole discretion, may issue a permit, subject to terms and conditions as he or she deems appropriate, to conduct an activity prohibited by 922.72(a)(3) through (10) and (a)(13) if the Director finds that the activity:
- (1) Is appropriate research designed to further understanding of Sanctuary resources and qualities;
 - (2) Will further the educational value of the Sanctuary;
 - (3) Will further salvage or recovery operations in or near the Sanctuary in connection with a recent air or marine casualty;
 - (4) Will assist in managing the Sanctuary; or
 - (5) Will further salvage or recovery operations in connection with an abandoned shipwreck in the Sanctuary title to which is held by the State of California.Permit applications shall be addressed to: Director, Office of Ocean and Coastal Resource Management, ATTN: Manager, Channel Islands National Marine Sanctuary, 113 Harbor Way, Santa Barbara, CA 93109.
- (c) The Director may not issue a permit under 922.48 and under this section unless the Director also finds that:
- (1) The proposed activity will have at most short-term and negligible adverse effects on Sanctuary resources and qualities;
 - (2) The applicant is professionally qualified to conduct and complete the proposed activity;
 - (3) The applicant has adequate financial resources available to conduct and complete the proposed activity;
 - (4) The duration of the proposed activity is no longer than necessary to achieve its stated purpose;
 - (5) The methods and procedures proposed by the applicant are appropriate to achieve the goals of the proposed activity, especially in relation to the potential effects of the proposed activity on Sanctuary resources and qualities;
 - (6) The proposed activity will be conducted in a manner compatible with the primary objective of protection of Sanctuary resources and qualities, considering the extent to which the conduct of the activity may diminish or enhance Sanctuary resources and qualities, any potential indirect, secondary, or cumulative effects of the activity, and the duration of such effects;
 - (7) The proposed activity will be conducted in a manner compatible with the value of the Sanctuary as a source of recreation and as a source of educational and scientific information, considering the extent to which the conduct of the activity may result in conflicts between different users of the sanctuary and the duration of such effects;
 - (8) It is necessary to conduct the proposed activity within the Sanctuary;
 - (9) The reasonably expected end value of the proposed activity furthers Sanctuary goals and purposes and outweighs any potential adverse effects on Sanctuary resources and qualities from the conduct of the activity; and
 - (10) Any other matters the Director deems appropriate do not make the issuance of a permit for the proposed activity inappropriate.In considering whether to grant a permit the Director shall evaluate such matters as:
 - (1) ~~The general professional, and financial responsibility of the applicant;~~
 - (2) ~~The appropriateness of the methods envisioned to the purpose(s) of the activity;~~
 - (3) ~~The extent to which the conduct of any permitted activity may diminish or enhance the value of the Sanctuary as a source of recreation, or as a source of educational or scientific information;~~

- ~~(4) The end value of the activity and~~
~~(5) Such other matters as may be deemed appropriate.~~
- (d) Applications.
- (1) Applications for permits should be addressed to the Director, Office of National Marine Sanctuaries; ATTN: Manager, Channel Islands National Marine Sanctuary, 113 Harbor Way, Santa Barbara, CA 93109.
 - (2) In addition to the information listed in 922.48(b), all applications must include information the Director needs to make the findings in paragraphs (b) and (c) of this section.
- (e) A permit may not be issued for a period exceeding five years. All permits will be reviewed annually to determine the permittee's compliance with the permit scope, purpose, terms, conditions, progress toward reaching the stated goals, and action taken under paragraph (f) of this section if warranted. A permittee may request permit renewal pursuant to the same procedures for applying for a new permit. Upon the permittee's request for renewal, the Director will review all reports submitted by the permittee as required by the permit terms and conditions. In order to renew the permit, the Director must at a minimum find that:
- (1) The activity will continue to further the purposes for which the Sanctuary was designated in accordance with the criteria applicable to the initial issuance of the permit; and
 - (2) The activity has not resulted in any unforeseen adverse effects on Sanctuary resources or qualities.
- (f) In addition to any other terms and conditions that the Director deems appropriate, a permit issued pursuant to this section must require that the permittee agrees to hold the United States harmless against any claims arising out of the conduct of the permitted activities.
- (g) A permit issued pursuant to this section may require that the permittee purchase and maintain general liability insurance or other acceptable security against potential claims for destruction, loss of, or injury to Sanctuary resources arising out of the permitted activities. The amount of insurance or security must be commensurate with an estimated value of the Sanctuary resources in the permitted area. A copy of the insurance policy or security instrument must be submitted to the Director.

The regulatory changes proposed above slightly augment the list of activities for which the Director may issue a permit, and specify which Sanctuary prohibitions permits may be applied to. While the existing Sanctuary regulations authorize the Director to issue permits for research, education, and salvage activities, the revised permit regulations add to this list activities that "will assist in managing the Sanctuary." This addition provides a mechanism by which the Director may issue permits for certain otherwise (without a permit) prohibited activities that will assist Sanctuary management. In addition, the revised permit regulations divide "salvage or recovery operations" into two activities for which the Director may issue a permit: those that further salvage or recovery operations in connection with an abandoned shipwreck in the Sanctuary title to which is held by the State of California; and those that further salvage or recovery operations in or near the Sanctuary in connection with a recent air or marine casualty. The modified permit regulations also specify that the Director may only issue permits for those activities that would otherwise (without a permit) violate the prohibitions proposed to be provided in 15 CFR 922.72(a)(3) through (10) and (a)(13): discharging and depositing; altering the submerged lands;

abandoning (structures, material or other matter on the submerged lands); nearshore operation of vessels; disturbing a seabird or marine mammal by aircraft overflight below 1000 feet within 1 NM of the Islands; moving, removing, injuring or possessing, or attempting to move, remove, injure or possess a Sanctuary historical resource; taking any marine mammal, sea turtle or seabird within or above the Sanctuary; possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird; and operating a motorized personal watercraft within waters of the Channel Islands National Park.

Another proposed modification to the permit regulations strengthens, based on the decades of permitting experience the NMSP now has, and augments the requirement that the Director consider certain criteria when evaluating permit applications. Whereas the existing regulation simply indicates that the Director shall evaluate certain matters in deciding whether to grant a permit, the proposed revised regulation states that the Director may not issue a permit unless the Director makes the findings listed under part (c) above. These findings make express several concepts not explicitly included as review criteria in the existing permit regulations: the proposed activity will have at most short term and negligible adverse effects on Sanctuary resources and qualities; the duration of the proposed activity is no longer than necessary to achieve its stated purpose; and it is necessary to conduct the proposed activity within the Sanctuary. The required findings also include modifications of several concepts that serve as review criteria in the existing regulation. Whereas the existing regulation simply requires the Director to evaluate the general professional and financial responsibility of the applicant, the revised review criteria clarify that the Director must find that the applicant is professionally qualified to conduct and complete the proposed activity; and that the applicant has adequate financial resources available to conduct and complete the proposed activity. In addition to several minor changes to the existing review criteria regarding the appropriateness of the methods proposed to conduct the activity, the revised criteria include a new clause emphasizing the consideration of potential indirect, secondary and cumulative effects of the proposed activity on Sanctuary resources and qualities. In addition to minor modifications to the existing review criteria regarding whether permitted activities may diminish or enhance the value of the Sanctuary as a source of recreation, or as a source of educational or scientific information, consideration of the extent to which the conduct of the activity may result in conflicts between different users of the Sanctuary, and the duration of such effects, has been added. Finally, in addition to considering the end value of the proposed activity, the modified regulation requires that the Director find that the reasonably expected end value of the proposed activity furthers Sanctuary goals and purposes and outweighs any potential adverse effects on Sanctuary resources and qualities from the conduct of the activity.

The existing permit regulations indicate that the Director must obtain certain information about applicants and their proposed activities in order to evaluate permit applications, but do not expressly indicate to prospective permit applicants what type of information they are required to include in their application. To clarify what information the permit applicant must provide the proposed revised permit regulations indicate that in addition to the information listed in 15 CFR 922.48(b), all permit applications must include information the Director needs to make the required findings described above.

The proposed revised permit regulations also further refine current requirements and procedures from general National Marine Sanctuary Program regulations (15 CFR 922.48(a) and (c)). The proposed modifications also clarify existing requirements for permit applications found in the Office of Management and Budget approved applicant guidelines (OMB Control Number 0648-0141).

The proposed modifications to the permit regulations (see (e) above) expressly require that in addition to any other terms and conditions that the Director deems appropriate, Sanctuary permits must require that the permittee agree to hold the United States harmless against any claims arising out of the permitted activities.

The overall intent of the proposed revised permit regulations is: to clarify, standardize, and make express the permit requirements and procedures, rendering them easier for permit applicants to comply with and for the Director and Sanctuary staff to implement; to ensure that permitted projects are appropriate for the Sanctuary; and to provide a mechanism for issuing permits for activities that may further Sanctuary management but would otherwise be prohibited. In summary the revised permit regulations: augment and clarify the list of activities for which the Director may issue a permit; clarify the list of prohibitions the Director may permit otherwise violations of; clarify the procedures, for submitting, evaluating, issuing, utilizing, reviewing, and renewing Sanctuary permits; and, based on the decades of permitting experience the NMSP now has, and make express the comprehensive set of criteria to be used by the Director when evaluating and reviewing permit applications.

2.1.17 CINMS Designation Document Changes

The CINMS terms of designation were originally set in 1980 upon establishment of the Sanctuary, and per the NMSA (16 U.S.C. 1434(a)(4)) describe the geographic area proposed to be included within the Sanctuary, the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational, or esthetic value, and the types of activities that will be subject to regulation by the Secretary to protect those characteristics. This information is contained within the CINMS Designation Document, which is composed of six articles: Article I, Effect of Designation; Article II, Description of the Area; Article III, Characteristics of the Area That Give it Particular Value; Article IV, Scope of Regulation; Article V, Relation to Other Regulatory Programs; and, Article VI, Alterations to this Designation. The NMSP is proposing several revisions to the Designation Document, which include changes to the description of the area, an updated and more accurate description of characteristics that give the Sanctuary particular value, an updated explanation of the relation to other regulatory programs, and some substantive changes to the Sanctuary's scope of regulations. The complete text of the Sanctuary's proposed Revised Designation Document is presented in Vol. II, Appendix D.

Several revisions are proposed for Article I, Effect of Designation. Among these are minor revisions to the description of the Sanctuary's authorization to issue regulations and the list of activities subject to Sanctuary regulation. In addition, a preamble to the Designation Document declaring the Sanctuary's designation has been replaced with information about the 1980 designation.

Proposed revisions to Article II of the Designation Document, the Description of the Area, include specifying that submerged lands are part of the Sanctuary, as well as correcting some Sanctuary boundary coordinates. At the time the Sanctuary was designated in 1980, Title III of the Marine Protection, Research, and Sanctuaries Act (also now known as the NMSA) characterized national marine sanctuaries as consisting of coastal and ocean waters, but did not expressly mention submerged lands there under. NOAA has consistently interpreted its authority under the NMSA as extending to submerged lands, and amendments to the NMSA in 1984 (Pub. L. 98-498) clarified that submerged lands may be designated by the Secretary of Commerce as part of a national marine sanctuary (16 U.S.C. 1432(3)). Therefore, consistent with the NMSA, the Sanctuary is proposing to include submerged lands in the description of the Sanctuary area and boundary, and to replace the term "seabed" with "submerged lands of the Sanctuary" throughout the Designation Document. In addition, proposed revisions include clarification that the landward boundary of the Sanctuary extends to the Mean High Water Line. Finally, technical corrections to the boundary coordinates are proposed based on the North American Datum of 1983 (NAD 83) in both the Revised Designation Document and in the Sanctuary regulations.

Proposed revisions to Article III of the Designation Document, the Characteristics of the Area That Give it Particular Value, are based on knowledge of Sanctuary resources and qualities gained since the original

1980 designation. This article has been augmented by a significant amount of new text, the intent of which is to provide an up to date, comprehensive yet succinct description of the Sanctuary's physical oceanography, habitats, species, cultural significance, and human use values (including recreational, commercial, scientific and educational values).

A number of the regulatory revisions included in this Proposed Action, as well as in Alternative 1, may not be implemented without broadening the Sanctuary's scope of regulations, the portion of the Sanctuary's Designation Document (Article IV) that describes in detail what the NMSP has the authority to regulate regarding the Sanctuary. Substantive proposed changes to the Sanctuary's Scope of Regulation include adding the following to Section 1 (Activities Subject to Regulation):

- Exploring for, developing, or producing minerals within the Sanctuary (see Prohibition 2);
- Discharging or depositing from beyond the boundary of the Sanctuary (see Prohibition 3);
- Placing or abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary (see Prohibition 5);
- Taking any marine mammal, sea turtle or seabird in or above the Sanctuary (see Prohibition 9);
- Possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle or seabird (see Prohibition 10);
- Marking, defacing, damaging, moving, removing, or tampering with any sign, notice or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary (see Prohibition 11); and
- Introducing or otherwise releasing an introduced species from within or into the Sanctuary (see Prohibition 12).

Substantive proposed changes to the Sanctuary's list of activities subject to regulation also include revising the following within Section 1 (Activities Subject to Regulation):

- Regarding Sanctuary historical resources, changing the activity description that reads "removing or otherwise deliberately harming cultural or historical resources" to "Moving, removing, injuring, possessing or attempting to move, remove, injure, or possess a Sanctuary historical resource" (see Prohibition 8); and
- Regarding altering the seabed, changing the activity description from "Dredging or alteration of, or construction on, the seabed" to "Drilling into, dredging, or otherwise altering the submerged lands of the Sanctuary; or constructing, placing, or abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary."

Article IV, Section 2 (Consistency with International Law) is proposed to be revised with language taken directly from sec. 305(a) of the NMSA, which deals with application of regulations. Also, several clarifications are proposed to Article IV, Section 3 (Emergency Regulations). These changes provide greater clarity to the applicability of Sanctuary emergency regulations.

Article V, Relation to Other Regulatory Programs, is currently made up of three sections: Fishing, Defense Activities, and Other Programs. Proposed revisions to Article 5 are limited to the third section

and include changing its title from “Other Programs” to “Effect on Leases, Permits, Licenses and Rights.” Additional proposed revisions are intended to provide clarity and specificity regarding the effects of Sanctuary designation on valid leases, permits, licenses and other authorizations in existence as of the date of Sanctuary designation. The proposed action presented and analyzed herein *does not* propose changes to the “Fishing” and “Defense Activities” sections of Article V.

Article VI, Alterations to This Designation, is proposed to be updated to reflect the NMSA as currently written.

The proposed revisions to the Sanctuary’s Designation Document provide updated and more accurate descriptions of Sanctuary characteristics, would better enable CINMS to address new and emerging resource management issues, and are necessary in order to ensure the protection and management of the conservation, ecological, recreational, scientific, educational, historical, cultural, archeological, and esthetic resources and qualities of the Sanctuary.

2.2 ALTERNATIVE 1

The regulations under Alternative 1 would be identical to those described for the Proposed Action with the exception of slightly more stringent wording and restrictions on the following regulations:

2.2.1 Prohibition 3 (Discharging and Depositing)

Prohibition 3 (Discharging or Depositing), would be modified to exclude any vessel of 300 gross registered tons or more from discharging treated sewage within the CINMS. For these larger vessels, this slightly more stringent regulation would remove the exception from prohibition for marine sanitation device (MSD) discharge. The purpose would be to prevent the greater quantities of waste associated with larger vessels from being discharged into the Sanctuary. In addition, by prohibiting such treated waste discharges, the intent would be also to reduce the chance of an accident or error occurring that could result in the release of untreated sewage, thereby providing greater protection to the Sanctuary’s water quality, helping to ensure the continued health and function of the ecosystem, and preventing unsightly discharges that could diminish the enjoyment of Sanctuary waters by other users.

This prohibition would augment existing protections afforded by other laws and regulations. The Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 *et seq.*) requires vessels with installed toilet facilities and operating on the navigable waters of the United States to contain operable marine sanitation devices certified as meeting standards and regulations promulgated under Section 312 of that act. In addition, as of January 1, 2005 California Assembly Bill (AB) 2672 banned cruise ships from dumping sewage from toilets within three miles of shore in California waters, which includes the first three miles from Island shores of Sanctuary waters. Finally, California AB 2093 prohibits large passenger vessels of 300 gross registered tons or more from discharging “graywater” in state waters. Graywater in this case is defined as drainage from dishwashers, showers, laundry, bath and washbasins. AB 2093 also establishes specific reporting requirements for releases of graywater in state waters of the four national marine sanctuaries in offshore from California, including CINMS. Collectively these other laws require operable marine sanitation devices for vessels with toilets, and prohibit large passenger vessels from discharging graywater (as defined above) and sewage from toilets while in state waters. However, no existing law or regulation affords special protection for the unique resources and qualities of the Channel Islands National Marine Sanctuary with regard to: sewage discharge by cruise ships within federal waters of the Sanctuary, and sewage discharge by other (non-cruise ship) large vessels in state or federal waters of the Sanctuary.

2.2.2 Prohibition 6 (Nearshore Operation of Vessels)

Prohibition 6 (Nearshore Operation of Vessels), would be modified to exclude any vessel of 150 gross registered tons or more (vs. 300) from operating within 1 NM of the shore in the Sanctuary. This would decrease the proposed vessel size limit from 300 to 150 gross registered tons, thus potentially applying to a greater number of vessels and, as such, further reducing the risk of vessel groundings or collisions in sensitive nearshore areas.

2.2.3 Prohibition 15 (Lightering)

This new regulation would prohibit lightering in the Sanctuary (see exceptions under an emergency below). Per the program-wide regulations, “lightering” means the at-sea transfer of petroleum-based products, materials, or other matter from one vessel to another. The intent of the prohibition is to protect Sanctuary resources and qualities from the adverse effects of spillage that may occur during non-emergency lightering operations.

Additional cross-cutting exceptions, which apply to multiple regulations in the proposed action, are applicable to this proposed regulation. These exceptions are presented below, using added text (underlined) and deleted text (strike-through). Military activity exemptions are discussed separately at 2.1.15.

- Except for an activity necessary to respond to an emergency threatening life, property, or the environment.
- Except for an activity necessary for valid law enforcement purposes in the Sanctuary.

Recurring causes of spills that appear to be directly related to lightering include valve failures, tank overflows, and hose ruptures. Recent United States Coast Guard (USCG) safety data for lightering (from 1984 to 1996) indicate that few spills occurred during lightering on the United States coast, and that, where spills did occur, the average volume was only 26 barrels (1,095 gallons) (NRC 1998). From 1993 to 1997, no spills were reported on the east or west coasts of the United States, and only seven spills (accounting for less than 0.003 percent of the total volume lightered) were reported in the Gulf of Mexico. Although lightering does not currently take place within the Sanctuary, this activity prohibition would preclude this activity from occurring in the future and would therefore protect Sanctuary resources from possible spills.

2.2.4 Designation Document Changes

As with the Proposed Action, Alternative 1 would require that the Sanctuary’s terms of designation be modified in the same manner as summarized in section 2.1.17 above and presented in Appendix D (Vol. II). One additional difference would be adding “lightering” as an activity subject to Sanctuary regulation under the scope of regulations.

2.3 NO-ACTION ALTERNATIVE

The No-Action Alternative would consist of no updates or other changes to any of the existing Sanctuary regulations, and no changes to the Sanctuary’s Designation Document. All existing CINMS-specific regulations would remain as they are currently written and no new regulations would be added. This alternative would not provide for Sanctuary regulation of certain current or possible future activities that pose a threat to Sanctuary resources. In addition, with the No-Action Alternative, some outdated

information would remain in place for CINMS regulations (e.g., technical description of the boundary, obsolete oil spill cleanup equipment requirements). Under a No-Action Alternative scenario the Sanctuary would attempt to address new or emerging resource protection issues by continuing to use status-quo non-regulatory approaches. Those status quo non-regulatory approaches are described here.

2.3.1 Prohibition 1 (Oil and Gas)

A status quo, non-regulatory approach to the proposed change in language to the Sanctuary's existing (1982) oil and gas regulation, which is proposed in order to remove outdated cleanup requirements, would be to leave the regulatory language unchanged. In this case, the language actually provides for outdated cleanup equipment standards, and as such is inappropriate given current technologies and the terms of existing oil spill contingency plans.

2.3.2 Prohibition 2 (Mineral Activities)

A status quo, no regulatory action approach to the proposed prohibition on exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to authorized hydrocarbon production, would be to rely on other existing Sanctuary regulations to provide some level of protection against the potential damaging environmental effects of mining activities. The existing Sanctuary regulation on seabed protection within the first 2 NM from the Islands, and possibly the Sanctuary's existing regulation prohibiting discharge and deposit of materials and matter, might serve as a limited deterrent to mining operations being conducted within the CINMS. However, such regulation would be indirect and leave the possibility that mining operations might be permissible in a large portion of the Sanctuary (i.e., beyond 2 NM from the Islands).

2.3.3 Prohibition 3 (Discharging or Depositing)

A status quo, non-regulatory approach to the proposed revision of the Sanctuary's discharge regulation that would clarify that discharges allowed from marine sanitation devices (MSDs) apply only to Type I and Type II MSDs would be to leave the existing regulation in place as written and rely on boater outreach and education efforts. As written, the existing Sanctuary regulation on discharge is intended to prohibit the release of raw sewage from vessels by requiring treatment from an MSD before discharge. However, the wording is not optimal because the specific type of MSD is not listed, and a Type III MSD does not actually provide any treatment to waste. Consequently, the no-action alternative would rely on status quo approaches to educational and outreach efforts explaining to boaters that, consistent with the original intent of the existing regulation, dumping of raw sewage within the Sanctuary is not permissible. Such ongoing education efforts would likely also involve helping boaters to understand where waste pumpout stations are located, and that discharge from a Type III MSD beyond the 6 NM outer Sanctuary boundary is not a violation of Sanctuary regulations. Consultation and assistance would also be sought from Sanctuary enforcement partners with the U.S. Coast Guard, National Park Service, California Department of Fish and Game, and the NOAA Office for Law Enforcement. These types of status quo education, outreach and agency coordination efforts would, however, also take place if the revised regulation were adopted to help raise awareness of and compliance with the discharge regulation. However, maintaining the regulation as it is currently written allows for potential confusion with some boaters not understanding the intent of the existing Sanctuary regulation and as a result engaging in raw sewage discharge into Sanctuary waters.

A status quo, non-regulatory approach to the proposed revision of the Sanctuary's existing discharge regulation that would specify that the exception for discharging or depositing fish, fish parts, or chumming materials (bait) applies only to lawful fishing activities within the Sanctuary would be to

employ existing education and consultative measures to promote voluntary compliance with the desired prohibition. With this non-regulatory approach, Sanctuary staff would use existing educational tools and take awareness building measures to encourage Sanctuary users to refrain from chumming Sanctuary waters for recreational or other purposes not associated with lawful fishing practices, and to not dump fish wastes from lawful fishing activity outside the Sanctuary. Although the action would not be illegal under this no-action alternative, efforts to explain to boaters the potential negative impacts of such an activity might help reduce the possibility of such practices taking place. Overall, this no regulatory action alternative would leave the Sanctuary more vulnerable to a possible increase in chumming practices for non-fishing purposes and to fish waste dumping because such an activity would not be prohibited and, as such, there would be no legal deterrent against it.

A status quo, non-regulatory approach to the proposed revision of the Sanctuary's discharge regulation that would remove an exception for discharging or depositing meals on board vessels would be to retain the existing exception and work through existing education and outreach measures to promote voluntary refraining from discharging meals on board vessels. With this non-regulatory approach, Sanctuary staff would use status quo educational tools and take awareness-building measures to encourage Sanctuary boaters to refrain from discharging food scraps into Sanctuary waters and to apprise them of Marine Plastic Pollution Research and Control Act of 1987 requirements. Although such discharges would not violate Sanctuary regulations under this alternative, efforts to explain to boaters the potential negative impacts of depositing food into the marine environment could help reduce the possibility of such practices taking place within the Sanctuary. Overall, this alternative would leave the Sanctuary more vulnerable to the effects of food waste disposal practices because such an activity would not be specifically prohibited and, as such, there would be no legal deterrent provided against it. In addition, this no-action alternative would leave in place the confusing nature of the existing Sanctuary discharge regulation, which provides an exception for the deposit of meals on board vessels within the Sanctuary despite the fact that the Marine Plastic Pollution Research and Control Act of 1987 (see 33 CFR Part 151) prohibits such discharges within 0 to 3 NM from shore, and permits the activity from 3 to 12 NM from shore only if food waste has been ground to less than 1 inch.

A status quo, non-regulatory approach to the proposed revision of the Sanctuary's discharge regulation that would prohibit discharges and deposits of any material or other matter from beyond the boundary of the Sanctuary that subsequently enter the Sanctuary and injure a Sanctuary resource or quality would be to work through existing education and consultative measures to promote voluntary compliance with the intent of the prohibition. With this non-regulatory alternative, Sanctuary staff would use status quo educational tools to encourage various entities operating outside of Sanctuary boundaries to avoid the intentional or accidental release of material or matter into the marine environment that could likely end up drifting into the Sanctuary and harming its resources and qualities. In addition, on a case by case basis, Sanctuary staff could consult with the proponents of new maritime-related projects that hold the potential to discharge, spill or otherwise release potentially harmful matter into waters near the Sanctuary, and request that such risks be reduced through appropriate project design or implementation measures. Similarly, this type of status quo consultation and commenting could be directed to other agencies that serve as authorizing agents for such projects. Overall, this non-regulatory educational and consultative approach may succeed in somewhat reducing threats to Sanctuary resources from discharges and deposits originating outside the Sanctuary boundary, but would lack a legal deterrent and civil penalty mechanism that the proposed regulatory prohibition would afford.

2.3.4 Prohibition 4 (Altering the Seabed)

A status quo, no new regulatory action approach to the proposed submerged lands protection regulation considered by the NMSP would be to address the risk of impacts to the Sanctuary from alteration of

submerged lands through existing Sanctuary regulations and non-regulatory management activities. The existing Sanctuary regulation prohibiting altering the submerged lands of the Sanctuary within the first 2 NM from Island shores (with exceptions for anchoring and commercial fishing bottom trawling) offers partial protection from seabed alteration. Other federal regulations prohibit unauthorized deposits upon, and placement of structures on, submerged lands with the intent of prohibiting potential obstructions to navigation. In addition to relying upon status quo regulations, the Sanctuary would use existing status quo education and outreach materials targeted at Sanctuary users to discourage them from conducting activities that may alter the submerged lands of the Sanctuary from the 2-6 NM zone offshore from the Islands. The proposed regulation, however, is the only alternative that explicitly protects the submerged lands of the Sanctuary in its 2-6 NM zone.

2.3.5 Prohibition 5 (Abandoning)

A status quo non-regulatory approach to the proposed abandoning prohibition considered by the NMSP would be to attempt to address the risk of impacts to the Sanctuary from abandoned structures or materials through existing Sanctuary regulations and other existing non-regulatory management programs. The existing Sanctuary regulation prohibiting the discharge of any material or matter, and the existing Sanctuary regulation prohibiting disturbance of the seabed within 2 NM of the Islands, may offer partial protection from abandoned structures, material or other matter. It is unlikely, however, that the Sanctuary's existing prohibition on discharge or deposit would apply to all possible abandonment situations. For example, research equipment left inserted into the sea floor of the Sanctuary may not clearly constitute a discharge or deposit. In addition, the Sanctuary's existing seabed protection regulation only provides protection from disturbance to the seabed in the portion of Sanctuary sea floor extending from the Islands to 2 NM offshore. In addition, existing non-regulatory management strategies could be employed to attempt to address threats from abandonment of structures, material, or other matter on or in the submerged lands of the Sanctuary. Educational outreach could be conducted to explain to boaters the importance of recovering any grounded vessel, and of not scuttling a vessel within the Sanctuary. Similarly, scientists conducting research upon or in the Sanctuary's sea floor could be encouraged to remove all equipment after such projects are completed. Overall, this alternative would lack the additional specificity and clarity that the proposed regulation brings to the issue of abandoning material or other matter within the Sanctuary, and would also not provide the added deterrence from abandonment activities that the proposed regulation would provide with NMSA-authorized civil penalties of up to \$130,000 per incident, per day.

2.3.6 Prohibition 6 (Nearshore Operation of Vessels)

A status quo, no new regulatory action approach to the proposed revised nearshore vessel operation regulation would involve operating under the status quo regulatory scenario. Existing Sanctuary regulations prohibit operating within 1 NM of an Island any vessel engaged in the trade of carrying cargo, including, but not limited to, tankers and other bulk carriers and barges, or any vessel engaged in the trade of servicing offshore installations, except to transport persons or supplies to or from an Island. This regulation allows for the legal operation of all other types of vessels, regardless of their size, such as cruise ships, privately owned vessels, charter vessels, vessels owned by educational, research or restoration NGOs, and salvage vessels. The status quo regulation does not apply to fishing or kelp harvesting vessels. The NMSP could use status quo approaches to target vessels from the non-prohibited categories, and that fall within the 300 gross registered ton or larger size class, with educational messages aimed at informing them of the potential dangers and environmental harm that may be caused by their operation within 1 NM of the Islands, and to request that they voluntarily anchor farther offshore and utilize smaller vessels to approach within 1 NM of the Islands. The proposed modified prohibition is

preferable since it more directly addresses the NMSP's concern that very large vessels, regardless of their purpose, not approach and therefore endanger sensitive nearshore areas of the Sanctuary.

2.3.7 Prohibition 7 (Disturbing a Seabird or Marine Mammal by Aircraft Overflight)

A status quo, no new regulatory action approach to the proposed revision of this regulation would lack an important clarification explaining that exceptions to this regulation do not override the obligation to comply with proposed Prohibition 9 (taking a marine mammal, seabird, or sea turtle). The status quo regulation would continue to prohibit disturbance of a seabird or marine mammal by flying a motorized aircraft at less than 1,000 feet over the waters within 1 NM of any Island, except to engage in kelp bed surveys or to transport persons or supplies to or from an Island.

2.3.8 Prohibition 8 (Moving, Removing, Possessing, or Injuring a Sanctuary Historical Resource)

A status quo, non regulatory action approach to revising and strengthening the Sanctuary's existing regulation prohibiting removing or damaging any historical or cultural resource such that it would more comprehensively represent a "hands-off" prohibition (i.e., add prohibitions on possessing, injuring or attempting to move, remove, or injure any Sanctuary historical resource) would require reliance upon the existing regulation. With this no action alternative, status quo educational and outreach activities could be conducted by Sanctuary staff to raise awareness about the detrimental impacts that can result not only from prohibited activities (i.e., removing or damaging), but other types of unregulated handling as well, such as possession of or attempting to move a historical resource. These educational efforts could be partially successful in reducing the possibility of such potentially damaging actions from occurring. Overall, this non-regulatory alternative would lack the legal deterrence and civil penalty mechanism provided by the proposed prohibition with regard to Sanctuary historical resources.

2.3.9 Prohibition 9 (Taking a Marine Mammal, Sea Turtle, or Seabird) and Prohibition 10 (Possessing a Marine Mammal, Sea Turtle, or Seabird)

A status quo non-regulatory approach to the proposed prohibitions would involve operating under the status quo regulatory scenario. No existing Sanctuary regulations prohibit take or possession of marine mammals, sea turtles, or seabirds. However, unauthorized take is prohibited by the Marine Mammal Protection Act (16 U.S.C. 1361 *et seq.*), the Endangered Species Act (16 U.S.C. 1531 *et seq.*), the Migratory Bird Treaty Act (16 U.S.C. 703 *et seq.*), and regulations promulgated under these acts. Thus, unauthorized take or possession of such animals, to the extent those acts apply, would remain prohibited within the Sanctuary regardless of whether the Sanctuary's proposed prohibition is implemented. However, the status quo scenario does not afford special protection for and civil penalty deterrence from take or possession of the abundant marine mammal and seabird populations found in the CINMS, nor special protection for sea turtles occasionally found within the Sanctuary. Added civil penalty deterrence cannot be accomplished without an added rule such as that proposed. As part of status quo operations, the NMSP would continue to consult with, and where appropriate, seek cooperating agency status under the National Environmental Policy Act, to discuss permit criteria and conditions with those agencies authorized to issue take permits under the aforementioned acts and regulations, as amended, promulgated there under. However, the NMSP would not have the authority to utilize its locally focused resources to enforce protection of marine mammals, sea turtles, and seabirds and would be required to rely on the enforcement efforts of non-locally focused agencies. The proposed modified prohibitions are preferred since they would authorize the NMSP to directly address take and possession of marine mammals, sea turtles, and seabirds of the CINMS, and since they would not add burden to the existing

permit/authorization structure under the Marine Mammal Protection Act, Endangered Species Act, and Migratory Bird Treaty Act.

2.3.10 Prohibition 11 (Tampering with Signs)

A status quo, non-regulatory approach to the proposed Sanctuary regulation prohibiting marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post or other boundary marker related to the Sanctuary would be to not regulate such activities and leave to chance the fate of such signs to acts of vandalism, theft or other damage. In addition, as new signs or markers are developed by the NMSP, Sanctuary staff could work with manufacturers to create products that are more resistant to demarcation or removal. Overall, this non-regulatory alternative would differ from the proposed new regulation in that it would lack the legal deterrence mechanism provided by the proposed prohibition.

2.3.11 Prohibition 12 (Releasing an Introduced Species)

A status quo non regulatory approach to the proposed prohibition on introduced species would involve operating under the status quo regulatory scenario. No existing Sanctuary regulations prohibit introducing or otherwise releasing introduced species from within or into the Sanctuary. Other rules establish federal programs to help prevent introduced species introductions via ballast water, and spawning, incubating or cultivating transgenic and exotic species is prohibited in California marine waters (Fish and Game Code 15007). Since existing rules do not afford prohibitions against non-transgenic introduced species introductions in state waters, and against any form of introduced species introductions in federal waters, the NMSP could proceed in a status quo manner to assist in non-regulatory reactive efforts to try to remove introduced species in harbors along the adjacent mainland coast, and proactive efforts distributing educational materials to users to inform them about problems associated with introduced species and how they can help prevent the spread of introduced species along California, and in CINMS. However, regulatory authority and associated civil penalties would likely be the most effective deterrent against introductions of introduced species into the Sanctuary.

2.3.12 Prohibition 13 (Operation of Motorized Personal Watercraft)

A status quo, no new regulatory action approach to the proposed Sanctuary regulation prohibiting the operation of motorized personal watercraft within waters of the Channel Islands National Park would be to rely on the existing National Park Service prohibition of this activity currently applicable to the same marine area (36 CFR 3.24). In addition, this status quo approach could involve status quo educational efforts by Sanctuary staff to help riders of motorized personal watercraft learn about the National Park Service prohibition, and assist with enforcement of that prohibition by reporting any sightings of illegal personal watercraft operation to appropriate law enforcement personnel, such as rangers with the Channel Islands National Park. What this alternative would lack (that the proposed Sanctuary prohibition would provide) is a stronger legal deterrent afforded by civil penalties applicable to violations of Sanctuary regulations, as authorized by the NMSA.

2.3.13 Regulation on Department of Defense Activities

A status quo, no new regulatory action approach to the proposed revised regulation on Department of Defense (DOD) activities would involve operating under the status quo scenario. Under the current DOD Sanctuary regulation, military activities that were described in the CINMS 1982 FEIS are exempt from the current Sanctuary regulations. However, the list of activities exempted no longer reflects current military activities in and around the Sanctuary, and as such the exemption is outdated from the standpoint

of both the DOD and the CINMS. Further, what constitutes a new activity is not clear. In addition, a no action alternative would mean that the current DOD regulation would not be expressly consistent with the NMSA, which has been reauthorized several times since the existing DOD regulation went into effect (1982), e.g., with regard to the requirements of prevention, mitigation, and restoration. For these reasons, the proposed revised regulation on DOD activities is preferred.

2.3.14 Regulation on Permit Procedures and Issuance Criteria

A status quo, no new regulatory action approach to the proposed revised permit regulation would involve operating under the status quo regulatory scenario. Existing Sanctuary regulations authorize the Director of the NMSP to issue permits for research, education, and salvage activities. They also guide the Director to evaluate such matters as: the general professional, and financial responsibility of the applicant; the appropriateness of the methods envisioned to the purpose(s) of the activity; the extent to which the conduct of any permitted activity may diminish or enhance the value of the Sanctuary as a source of recreation, or as a source of educational or scientific information; the end value of the activity; and such other matters as may be deemed appropriate. These regulations do not provide a clear mechanism by which the Sanctuary may achieve its objective of issuing permits for activities that would further Sanctuary management, but otherwise be prohibited. These regulations also imply certain types of information the Director requires in order to evaluate permit applications, but do not expressly indicate to prospective permit applicants what type of information they will be required to submit. Nor, for example, are the current regulations always as explicit about the review criteria as might be desirable. While these and other details the NMSP would like to clarify could be included in the permit application instructions and the actual Sanctuary permit text, codifying such details in the regulations provides a clear set of guidelines that are legally binding for the NMSP and CINMS as the permit issuing bodies, and for permit applicants. As such the proposed modified permit regulation is preferable.

2.4 ALTERNATIVES CONSIDERED BUT DISMISSED

Addition of a prohibition on extractive bioprospecting for commercial purposes was considered but dismissed from further consideration. Biodiversity prospecting, or bioprospecting, is the activity of seeking a useful application, process, or product from nature. In many cases, bioprospecting is a search for useful organic compounds in microorganisms, plants, and fungi (NPS 2001). Bioprospecting in the ocean can provide products other than seafood, such as ornamental marine life, raw materials, and medicines. For example, through marine bioprospecting an extract (arabinsides) was collected from the sponge *Tethya crypta* that led to more than \$50 million in annual sales of derived antiviral medicines (NMFS 2001; Norse 1993). The most common use of materials from marine bioprospecting is for the production of pharmaceuticals. Marine bioprospecting may lead to include sampling and can lead to extraction of a living marine resource for commercial purposes.

There is no known bioprospecting within the Sanctuary at this time. However, there are research projects funded by MMS in which the potential beneficial properties of marine life attached to the submerged structure of a sample of offshore oil platforms in the Santa Barbara Channel are being investigated.

Because removing marine life or plants for bioprospecting may potentially lead to habitat and ecosystem alterations, prohibition of bioprospecting in the Sanctuary was considered. The implications of marine bioprospecting within the Sanctuary are not clearly understood. This regulation was dismissed from further consideration for this management plan update.

**Table 2.1-1
Regulatory Alternatives Considered for the CINMS Management Plan Update**

<p>No Action (Status Quo)</p>	<p>Proposed Action Underlined (new) and striethrough (deleted) text show differences from No Action (Status Quo)</p>	<p>Alternative 1 (bold text is different from Proposed Action)</p>
<p>Sanctuary Boundary (15 CFR 922.70). The Channel Islands National Marine Sanctuary (Sanctuary) consists of an area of the waters off the coast of California of approximately 1252.5 square nautical miles (NM) adjacent to the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (collectively the Islands) extending seaward to a distance of six NM. The boundary coordinates are listed in appendix A to this subpart.</p>	<p>Sanctuary Boundary. The Channel Islands National Marine Sanctuary (Sanctuary) consists of an area of the waters off the coast of California of approximately 1252.51243 square nautical miles (NM) of coastal and ocean waters, and the submerged lands thereunder, off the southern coast of California. The Sanctuary boundary begins at the Mean High Water Line of and extends seaward to a distance of approximately six NM adjacent to <u>from</u> the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (collectively the Islands) extending seaward to a distance of six NM. The <u>seaward</u> boundary coordinates are listed in the a<u>Appendix</u> A to this subpart.</p>	<p>Sanctuary Boundary. Same as Proposed Action</p>
<p>1. Oil and Gas. Prohibited: Exploring for, developing, and producing hydrocarbons except pursuant to leases executed prior to March 30, 1981, and except the laying of pipeline, if the following oil spill contingency equipment is available at the site of such operations: (i) 1500 feet of open ocean containment boom and a boat capable of deploying the boom; (ii) One oil skimming device capable of open ocean use; and (iii) Fifteen bales of oil sorbent material, and subject to all prohibitions, restrictions and conditions imposed by applicable regulations, permits, licenses or other authorizations and consistency reviews including those issued by the Department of the Interior, the Coast Guard, the Corps of Engineers, the Environmental Protection Agency and under the California Coastal Management Program and its implementing regulations. Other Exceptions: • Except as may be necessary for the national defense • Except as may be necessary to respond to an emergency threatening life, property, or the environment • Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72</p>	<p>1. Oil and Gas. Prohibited: Exploring for, developing, and/or producing hydrocarbons <u>within the Sanctuary</u>, except pursuant to leases executed prior to March 30, 1981, and except the laying of pipeline <u>pursuant to exploring for, developing, or producing hydrocarbons</u>, if the following oil spill contingency equipment is available at the site of such operations: (i) 1500 feet of open ocean containment boom and a boat capable of deploying the boom; (ii) One oil skimming device capable of open ocean use; and (iii) Fifteen bales of oil sorbent material, and subject to all prohibitions, restrictions and conditions imposed by applicable regulations, permits, licenses or other authorizations and consistency reviews including those issued by the Department of the Interior, the Coast Guard, the Corps of Engineers, the Environmental Protection Agency and under the California Coastal Management Program and its implementing regulations. Other Exceptions: • Except as may be necessary for the national defense • Except as may be necessary to respond to an emergency threatening life, property, or the environment; • Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72</p>	<p>1. Oil and Gas. Same as Proposed Action</p>
<p>2. Mineral Activities. No existing regulation</p>	<p>2. Mineral Activities. Prohibited: <u>Exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to hydrocarbon production allowed by paragraph (a)(1) of this section [see #1 above].</u></p>	<p>2. Mineral Activities. Same as Proposed Action</p>

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**Table 2.1-1
Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)**

<p>No Action (Status Quo)</p>	<p>Proposed Action <u>Underlined</u> (new) and strike through (deleted) text show differences from No Action (Status Quo)</p>	<p>Alternative 1 (bold text is different from Proposed Action)</p>
<p>3. Discharging or Depositing. Prohibited: Discharging or depositing any material or other matter except: (i) Fish or fish parts and chumming materials (bait); (ii) Water (including cooling water) and other biodegradable effluents incidental to vessel use of the Sanctuary generated by: (A) Marine sanitation devices; (B) Routine vessel maintenance, e.g., deck wash down; (C) Engine exhaust; or (D) Meals on board vessels; (iii) Effluents incidental to hydrocarbon exploration and exploitation activities allowed by paragraph (a)(1) of this section [see #1 above].</p> <p>Other Exceptions:</p> <ul style="list-style-type: none"> • Except as may be necessary for the national defense • Except as may be necessary to respond to an emergency threatening life, property, or the environment • Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72 	<p>3. Discharging or Depositing. Prohibited: Discharging or depositing <u>from within or into the Sanctuary</u> any material or other matter except: <u>(A)(i) Fish, or fish parts, and or chumming materials (bait) used in or resulting from lawful fishing activity within the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity within the Sanctuary;</u> <u>(B)(ii) Water (including cooling water) and other biodegradable effluents incidental to vessel use of the Sanctuary and generated by:</u> <u>(A) an operable Type I or II marine sanitation devices (U.S. Coast Guard classification) approved in accordance with section 312 of the Federal Water Pollution Control Act, as amended, (FWPCA), 33 U.S.C. 1321 et seq. Vessel operators must lock all marine sanitation devices in a manner that prevents discharge of untreated sewage;</u> <u>(B)(C) Routine vessel maintenance, e.g., Biodegradable matter from a vessel resulting from deck wash down, vessel engine cooling water, or graywater as defined by section 312 of the FWPCA;</u> (C)(D) Vessel eEngine or generator exhaust; or (D) Meals on board vessels; (iii) (E) Effluents routinely and necessarily discharged or deposited incidental to hydrocarbon exploration, development, or production and exploitation activities allowed by paragraph (a)(1) of this section [see #1 above]; <u>(F) Discharges allowed under section 312(n) of the FWPCA; or</u> <u>(ii) Discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality, except those listed in subparagraphs (a)(3)(i)(B) through (F) of this section and fish, fish parts, or chumming materials (bait) used in or resulting from lawful fishing activity beyond the boundary of the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity there.</u></p> <p>Other Exceptions:</p> <ul style="list-style-type: none"> • Except as may be permitted by the Director in accordance with <u>the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR secs. 922.48 and 922.723.</u> • Except as may be for an activity necessary to respond to an emergency threatening life, property, or the environment. • <u>Except for an activity necessary for valid law enforcement purposes in the Sanctuary.</u> • [See Department of Defense at the end of this table.] 	<p>3. Discharging or Depositing. Prohibited: Discharging or depositing <u>from within or into the Sanctuary</u> any material or other matter except: <u>(A)(i) Fish, or fish parts, and or chumming materials (bait) used in or resulting from lawful fishing activity within the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity within the Sanctuary;</u> <u>(B)(ii) Water (including cooling water) and other biodegradable effluents incidental to vessel use of the Sanctuary and generated by: (A) an operable Type I or II marine sanitation devices (U.S. Coast Guard classification) approved in accordance with section 312 of the Federal Water Pollution Control Act, as amended, (FWPCA), 33 U.S.C. 1321 et seq. excluding any vessel of 300 gross registered tons or more. Vessel operators must lock all marine sanitation devices in a manner that prevents discharge of untreated sewage;</u> <u>(B)(C) Routine vessel maintenance, e.g., Biodegradable matter from a vessel resulting from deck wash down, vessel engine cooling water, or graywater as defined by section 312 of the FWPCA;</u> (C)(D) Vessel eEngine or generator exhaust; or (D) Meals on board vessels; (iii) (E) Effluents routinely and necessarily discharged or deposited incidental to hydrocarbon exploration, development, or production and exploitation activities allowed by paragraph (a)(1) of this section [see #1 above]; <u>(F) Discharges allowed under section 312(n) of the FWPCA; or</u> <u>(ii) Discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality, except those listed in subparagraphs (a)(3)(i)(B) through (F) of this section and fish, fish parts, or chumming materials (bait) used in or resulting from lawful fishing activity beyond the boundary of the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity there.</u></p> <p>Other Exceptions:</p> <ul style="list-style-type: none"> • Except as may be permitted by the Director in accordance with <u>the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR secs. 922.48 and 922.723.</u> • Except as may be for an activity necessary to respond to an emergency threatening life, property, or the environment. • <u>Except for an activity necessary for valid law enforcement purposes in the Sanctuary.</u> • [See Department of Defense at the end of this table.]

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**Table 2.1-1
Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)**

<p>No Action (Status Quo)</p>	<p>Proposed Action <u>Underlined</u> (new) and struckthrough (deleted) text show differences from No Action (Status Quo)</p>	<p>Alternative 1 (bold text is different from Proposed Action)</p>
<p>4. Altering the Seabed. Prohibited: Except in connection with the laying of any pipeline as allowed by paragraph (a)(1) of this section, within 2 NM of any Island: (i) Constructing any structure other than a navigation aid, (ii) Drilling through the seabed, or (iii) Dredging or otherwise altering the seabed in any way, other than (A) To anchor vessels, or (B) To bottom trawl from a commercial fishing vessel. Other Exceptions: <ul style="list-style-type: none"> • Except as may be necessary for the national defense • Except as may be necessary to respond to an emergency threatening life, property, or the environment, • Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72 </p>	<p>4. Altering the Submerged Lands. Prohibited: Except in connection with the laying of any pipeline as allowed by paragraph (a)(1) of this section, within 2 NM of any Island: (ii) Drilling into through the seabed, (iii) Dredging, or otherwise altering the seabed <u>submerged lands of the Sanctuary in any way, other than: (i) or</u> Constructing or placing any structure other than a navigation aid, material, or other matter on or in the submerged lands of the Sanctuary, except as incidental to and necessary to: (A)(i) To anchor a <u>vessels;</u> (ii) <u>Install an authorized navigational aid;</u> (B) (iii) To bottom trawl from a commercial fishing vessel <u>Conduct lawful fishing activity;</u> (iv) <u>Lay pipeline pursuant to exploring for, developing, or producing hydrocarbons; or</u> (v) <u>Explore for, develop, or produce hydrocarbons as allowed by subparagraph (a)(1) of this section [see #1 above].</u> Other Exceptions: <ul style="list-style-type: none"> • <u>Except as may be permitted by the Director in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR secs. 922.48 and 922.723.</u> • <u>Except as may be for an activity necessary to respond to an emergency threatening life, property, or the environment.</u> • <u>Except for an activity necessary for valid law enforcement purposes in the Sanctuary.</u> • [See Department of Defense at the end of this table.] </p>	<p>4. Altering the Submerged Lands. Same as Proposed Action</p>
<p>5. Abandoning. No existing regulation</p>	<p>5. Abandoning. Prohibited: <u>Abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary.</u> Exceptions: <ul style="list-style-type: none"> • <u>Except in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.73.</u> • <u>Except for an activity necessary to respond to an emergency threatening life, property, or the environment.</u> • <u>Except for an activity necessary for valid law enforcement purposes in the Sanctuary.</u> • [See Department of Defense at the end of this table.] </p>	<p>5. Abandoning. Same as Proposed Action</p>

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**Table 2.1-1
Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)**

<p>No Action (Status Quo)</p>	<p>Proposed Action Underlined (new) and struckthrough (deleted) text show differences from No Action (Status Quo)</p>	<p>Alternative 1 (bold text is different from Proposed Action)</p>
<p>6. Nearshore Operation of Vessels.</p> <p>Prohibited: Except to transport persons or supplies to or from an Island, operating within one NM of an Island any vessel engaged in the trade of carrying cargo, including, but not limited to, tankers and other bulk carriers and barges, or any vessel engaged in the trade of servicing offshore installations. In no event shall this section be construed to limit access for fishing (including kelp harvesting), recreational, or research vessels.</p> <p>Other Exceptions:</p> <ul style="list-style-type: none"> • Except as may be necessary for the national defense • Except as may be necessary to respond to an emergency threatening life, property, or the environment, • Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72 	<p>6. Nearshore Operation of Vessels.</p> <p>Prohibited: Except to transport persons or supplies to or from any Island, operating within one NM of any Island any vessel engaged in the trade of carrying cargo, including, but not limited to, tankers and other bulk carriers and barges, or any vessel engaged in the trade of servicing offshore installations, <u>or any vessel of three hundred gross registered tons or more, except.</u> In no event shall this section be construed to limit access for fishing (including or kelp harvesting), recreational, or research vessels.</p> <p>Other Exceptions:</p> <ul style="list-style-type: none"> • <u>Except as may be permitted by the Director in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR secs. 922.48 and 922.723.</u> • <u>Except as may be for an activity necessary to respond to an emergency threatening life, property, or the environment.</u> • <u>Except for an activity necessary for valid law enforcement purposes in the Sanctuary.</u> • [See Department of Defense at the end of this table.] 	<p>6. Nearshore Operation of Vessels.</p> <p>Prohibited: Except to transport persons or supplies to or from any Island, operating within one NM of any Island any vessel engaged in the trade of carrying cargo, including, but not limited to, tankers and other bulk carriers and barges, or any vessel engaged in the trade of servicing offshore installations, or any vessel of one hundred fifty gross registered tons or more, except. In no event shall this section be construed to limit access for fishing (including or kelp harvesting), recreational, or research vessels.</p> <p>Other Exceptions:</p> <ul style="list-style-type: none"> • <u>Except as may be permitted by the Director in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR secs. 922.48 and 922.723.</u> • <u>Except as may be for an activity necessary to respond to an emergency threatening life, property, or the environment.</u> • <u>Except for an activity necessary for valid law enforcement purposes in the Sanctuary.</u> • [See Department of Defense at the end of this table.]
<p>7. Disturbing a Seabird or Marine Mammal by Aircraft.</p> <p>Prohibited: Disturbing seabirds or marine mammals by flying motorized aircraft at less than 1000 feet over the waters within one NM of any Island except:</p> <p>(i) For enforcement purposes;</p> <p>(ii) To engage in kelp bed surveys; or</p> <p>(iii) To transport persons or supplies to or from an Island.</p> <p>Other Exceptions:</p> <ul style="list-style-type: none"> • Except as may be necessary for the national defense • Except as may be necessary to respond to an emergency threatening life, property, or the environment • Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72 	<p>7. Disturbing a Seabird or Marine Mammal by Aircraft.</p> <p>Prohibited: Disturbing a seabirds or marine mammals by flying a motorized aircraft at less than 1000 feet over the waters within one NM of any Island, <u>except, if allowed under subparagraph (a)(9) of this section [see #9 below]:</u></p> <p>(i) For enforcement purposes;</p> <p>(ii) (i) to engage in kelp bed surveys; or</p> <p>(iii) (ii) to transport persons or supplies to or from an Island.</p> <p>Other Exceptions:</p> <ul style="list-style-type: none"> • <u>Except as may be permitted by the Director in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR secs. 922.48 and 922.723.</u> • <u>Except as may be for an activity necessary to respond to an emergency threatening life, property, or the environment.</u> • <u>Except for an activity necessary for valid law enforcement purposes in the Sanctuary.</u> • [See Department of Defense at the end of this table.] 	<p>7. Disturbing a Seabird or Marine Mammal by Aircraft.</p> <p>Same as Proposed Action</p>

Table 2.1-1, Page 4 of 9

**Table 2.1-1
Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)**

<p>No Action (Status Quo)</p>	<p>Proposed Action <u>Underlined</u> (new) and struck through (deleted) text show differences from No Action (Status Quo)</p>	<p>Alternative 1 (bold text is different from Proposed Action)</p>
<p>8. Moving, Removing, or Injuring a Sanctuary Historical Resource.</p> <p>Prohibited: Removing or damaging any historical or cultural resource.</p> <p>Other Exceptions:</p> <ul style="list-style-type: none"> • Except as may be necessary for the national defense • Except as may be necessary to respond to an emergency threatening life, property, or the environment, • Except as may be permitted by the Director in accordance with 15 CFR secs. 922.48 and 922.72 	<p>8. Moving, Removing, or Injuring a Sanctuary Historical Resource.</p> <p>Prohibited: <u>Moving, Removing, injuring, or possessing, or attempting to move, remove, injure, or possess or damaging any a Sanctuary historical or cultural resource.</u></p> <p>Exceptions:</p> <ul style="list-style-type: none"> • <u>Except as may be permitted by the Director in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR secs. 922.48 and 922.723.</u> • <u>Except as may be for an activity</u> necessary to respond to an emergency threatening life, property, or the environment. • <u>Except for an activity necessary for valid law enforcement purposes in the Sanctuary.</u> • [See Department of Defense at the end of this table.] 	<p>8. Moving, Removing, or Injuring a Sanctuary Historical Resource.</p> <p>Same as Proposed Action</p>
<p>9. Taking a Marine Mammal, Sea Turtle, or Seabird.</p> <p>No existing regulation</p>	<p>9. Taking a Marine Mammal, Sea Turtle, or Seabird.</p> <p>Prohibited: <u>Taking any marine mammal, sea turtle, or seabird within or above the Sanctuary, except as expressly authorized by the Marine Mammal Protection Act, as amended, (MMPA), 16 U.S.C. 1361 et seq., Endangered Species Act, as amended, (ESA), 16 U.S.C. 1531 et seq., Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. 703 et seq., or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA.</u></p> <p>Other Exceptions:</p> <ul style="list-style-type: none"> • <u>Except in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.73.</u> • <u>Except for an activity necessary to respond to an emergency threatening life, property, or the environment.</u> • <u>Except for an activity necessary for valid law enforcement purposes in the Sanctuary.</u> • [See Department of Defense at the end of this table.] 	<p>9. Taking a Marine Mammal, Sea Turtle, or Seabird.</p> <p>Same as Proposed Action</p>
<p>10. Possessing a Marine Mammal, Sea Turtle, or Seabird.</p> <p>No existing regulation</p>	<p>10. Possessing a Marine Mammal, Sea Turtle, or Seabird.</p> <p>Prohibited: <u>Possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as expressly authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA.</u></p> <p>Other Exceptions:</p> <ul style="list-style-type: none"> • <u>Except in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.73.</u> • <u>Except for an activity necessary to respond to an emergency threatening life, property, or the environment.</u> • <u>Except for an activity necessary for valid law enforcement purposes in the Sanctuary.</u> • [See Department of Defense at the end of this table.] 	<p>10. Possessing a Marine Mammal, Sea Turtle, or Seabird</p> <p>Same as Proposed Action</p>

Table 2.1-1, Page 5 of 9

**Table 2.1-1
Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)**

No Action (Status Quo)	Proposed Action <u>Underlined (new) and strikethrough (deleted) text show differences from No Action (Status Quo)</u>	Alternative 1 (bold text is different from Proposed Action)
<p>11. Tampering with Signs</p> <p>No existing regulation</p>	<p>11. Tampering with Signs</p> <p>Prohibited: <u>Marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary.</u></p> <p>Exceptions:</p> <ul style="list-style-type: none"> • <u>Except for an activity necessary to respond to an emergency threatening life, property, or the environment.</u> • <u>Except for an activity necessary for valid law enforcement purposes in the Sanctuary.</u> • [See Department of Defense at the end of this table.] 	<p>11. Tampering with Signs</p> <p>Same as Proposed Action</p>
<p>12. Releasing an Introduced Species</p> <p>No existing regulation</p>	<p>12. Releasing an Introduced Species</p> <p>Prohibited: <u>Introducing or otherwise releasing from within or into the Sanctuary an introduced species, except striped bass (<i>Roccus saxatilis</i>) released during catch and release fishing activity.</u></p> <p>Exceptions:</p> <ul style="list-style-type: none"> • <u>Except in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.73.</u> • [See Department of Defense at the end of this table.] <p>Proposed definition (at Sec. 922.71): <u>Introduced species means (1) a species (including but not limited to any of its biological matter capable of propagation) that is non-native to the ecosystems protected by the Sanctuary; or (2) any organism into which genetic matter from another species has been transferred in order that the host organism acquires the genetic traits of the transferred genes.</u></p>	<p>12. Releasing an Introduced Species</p> <p>Same as Proposed Action</p>
<p>13. Operation of Motorized Personal Watercraft</p> <p>No existing regulation</p>	<p>13. Operation of Motorized Personal Watercraft</p> <p>Prohibited: <u>Operating a motorized personal watercraft within waters of the Channel Islands National Park, established by 16 U.S.C. 410(ff).</u></p> <p>Proposed definition (at Sec. 922.71): <u>Motorized personal watercraft means a vessel, usually less than 16 feet in length, which uses an inboard, internal combustion engine powering a water jet pump as its primary source of propulsion. The vessel is intended to be operated by a person or persons sitting, standing or kneeling on the vessel, rather than within the confines of the hull. The length is measured from end to end over the deck excluding sheer, meaning a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline. Bow sprits, bumpkins, rudders, outboard motor brackets, and similar fittings or attachments, are not included in the measurement. Length is stated in feet and inches.</u></p> <p>Exceptions:</p> <ul style="list-style-type: none"> • <u>Except in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.73.</u> • <u>Except for an activity necessary to respond to an emergency threatening life, property, or the environment.</u> • <u>Except for an activity necessary for valid law enforcement purposes in the Sanctuary.</u> • [See Department of Defense at the end of this table.] 	<p>13. Operation of Motorized Personal Watercraft</p> <p>Same as Proposed Action</p>

Table 2.1-1, Page 6 of 9

**Table 2.1-1
Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)**

No Action (Status Quo)	Proposed Action <u>Underlined</u> (new) and struckthrough (deleted) text show differences from No Action (Status Quo)	Alternative 1 (bold text is different from Proposed Action)
<p>14. Lightering</p> <p>No existing regulation</p>	<p>14. Lightering</p> <p>No regulation proposed</p>	<p>14. Lightering</p> <p>Prohibited: Lightering in the Sanctuary.</p> <p>Note: Sanctuary regulations define lightering as at-sea transfer of petroleum-based products, materials, or other matter from vessel to vessel (15 CFR 922.3).</p> <p>Exceptions:</p> <ul style="list-style-type: none"> • Except for an activity necessary to respond to an emergency threatening life, property, or the environment. • Except for an activity necessary for valid law enforcement purposes in the Sanctuary. • [See Department of Defense at the end of this table.]
<p>Department of Defense Activities.</p> <p>All activities currently carried out by the Department of Defense within the Sanctuary are essential for the national defense and, therefore, not subject to the prohibitions in this section. The exemption of additional activities having significant impact shall be determined in consultation between the Director and the Department of Defense.</p>	<p>Department of Defense Activities.</p> <p>(b) All activities currently carried out by the Department of Defense within the Sanctuary are essential for the national defense and, therefore, not subject to the prohibitions in this section. The exemption of additional activities having significant impact shall be determined in consultation between the Director and the Department of Defense.</p> <p><u>(b)(1) The prohibitions in paragraphs (a)(3) through (13) do not apply to military activities carried out by DOD as of the effective date of these regulations and specifically identified in section 3.5.9 (Department of Defense Activities) of the Final Channel Islands National Marine Sanctuary Management Plan/Environmental Impact Statement (FMP/FEIS), Volume II: Environmental Impact Statement, 200 [year of completion of the FMP/FEIS will be entered here], authored and published by NOAA ("pre-existing activities"). Copies of the document are available from the Channel Islands National Marine Sanctuary, 113 Harbor Way, Santa Barbara, CA 93109. Other military activities carried out by DOD may be exempted by the Director after consultation between the Director and DOD.</u></p> <p><u>(2) A military activity carried out by DOD as of the effective date of these regulations and specifically identified in the section entitled "Department of Defense Activity" of the FMP/FEIS is not considered a pre-existing activity if:</u></p> <p><u>(A) it is modified in such a way that requires the preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act, 42 U.S.C. 4321 et seq., relevant to a Sanctuary resource or quality;</u></p> <p><u>(B) it is modified, including but not limited to changes in location or frequency, in such a way that its possible adverse effects on Sanctuary resources or qualities are significantly greater than previously considered for the unmodified activity;</u></p> <p><u>(C) it is modified, including but not limited to changes in location or frequency, in such a way that its possible adverse effects on Sanctuary resources or qualities are significantly different in manner than previously considered for the unmodified activity; or</u></p> <p><u>(D) there are new circumstances or information relevant to a Sanctuary resource or quality that were not addressed in the FMP/FEIS.</u></p> <p><u>(3) In the event of destruction of, loss of, or injury to a Sanctuary resource or quality resulting from an incident, including, but not limited to, discharges, deposits, and groundings, caused by a DOD activity, DOD, in coordination with the Director, must promptly prevent and mitigate further damage and must restore or replace the Sanctuary resource or quality in a manner approved by the Director.</u></p> <p><u>(4) All DOD activities must be carried out in a manner that avoids to the maximum extent practicable any adverse impacts on Sanctuary resources and qualities.</u></p>	<p>Department of Defense Activities.</p> <p>Same as Proposed Action.</p>

Table 2.1-1, Page 7 of 9

**Table 2.1-1
Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)**

No Action (Status Quo)	Proposed Action <u>Underlined</u> (new) and struckthrough (deleted) text show differences from No Action (Status Quo)	Alternative 1 (bold text is different from Proposed Action)
<p>Permit Procedures and Issuance Criteria.</p> <p>(a) Any person in possession of a valid permit issued by the Director in accordance with this section and Sec.922.48 may conduct any activity in the Sanctuary prohibited under Sec. 922.71 [see above] if such activity is either:</p> <p>(1) Research related to the resources of the Sanctuary,</p> <p>(2) To further the educational value of the Sanctuary; or</p> <p>(3) For salvage or recovery operations.</p> <p>(b) Permit applications shall be addressed to: Director, Office of Ocean and Coastal Resource Management, ATTN: Manager, Channel Islands National Marine Sanctuary, 113 Harbor Way, Santa Barbara, CA 93109.</p> <p>(c) In considering whether to grant a permit the Director shall evaluate such matters as:</p> <p>(1) The general professional, and financial responsibility of the applicant;</p> <p>(2) The appropriateness of the methods envisioned to the purpose(s) of the activity;</p> <p>(3) The extent to which the conduct of any permitted activity may diminish or enhance the value of the Sanctuary as a source of recreation, or as a source of educational or scientific information;</p> <p>(4) The end value of the activity and</p> <p>(5) Such other matters as may be deemed appropriate.</p> <p>The Director may observe any permitted activity and/or require the submission of one or more reports of the status or progress of such activity. Any information obtained shall be available to the public.</p>	<p>Permit Procedures and Issuance Criteria.</p> <p>(a) Any person in possession of a valid permit issued by the Director in accordance with this section and Sec.922.48 may conduct any activity in the Sanctuary prohibited under by 922.71+2(a)(3) through (10), (a)(12), and (a)(13) if such activity is either:</p> <p>(1) <u>Research related to the resources of the Sanctuary;</u></p> <p>(2) <u>To further the educational value of the Sanctuary; or</u></p> <p>(3) <u>For salvage or recovery operations specifically authorized by, and conducted in accordance with the scope, purpose, terms, and conditions of, a permit issued under 922.48 and this section.</u></p> <p>(b) <u>The Director, at his or her sole discretion, may issue a permit, subject to terms and conditions as he or she deems appropriate, to conduct an activity prohibited by 922.72(a)(3) through (10), (a)(12), and (a)(13) if the Director finds that the activity:</u></p> <p>(1) <u>Is appropriate research designed to further understanding of Sanctuary resources and qualities;</u></p> <p>(2) <u>Will further the educational value of the Sanctuary;</u></p> <p>(3) <u>Will further salvage or recovery operations in or near the Sanctuary in connection with a recent air or marine casualty;</u></p> <p>(4) <u>Will assist in managing the Sanctuary; or</u></p> <p>(5) <u>Will further salvage or recovery operations in connection with an abandoned shipwreck in the Sanctuary title to which is held by the State of California.</u></p> <p>(c) <u>In considering whether to grant a permit the Director shall evaluate such matters as: The Director may not issue a permit under 922.48 and this section unless the Director also finds that:</u></p> <p>(1) <u>The general professional, and financial responsibility of the applicant;</u></p> <p>(2) <u>The appropriateness of the methods envisioned to the purpose(s) of the activity;</u></p> <p>(3) <u>The extent to which the conduct of any permitted activity may diminish or enhance the value of the Sanctuary as a source of recreation, or as a source of educational or scientific information;</u></p> <p>(4) <u>The end value of the activity and</u></p> <p>(5) <u>Such other matters as may be deemed appropriate.</u></p> <p>(1) <u>The proposed activity will have at most short-term and negligible adverse effects on Sanctuary resources and qualities;</u></p> <p>(2) <u>The applicant is professionally qualified to conduct and complete the proposed activity;</u></p> <p>(3) <u>The applicant has adequate financial resources available to conduct and complete the proposed activity;</u></p> <p>(4) <u>The duration of the proposed activity is no longer than necessary to achieve its stated purpose;</u></p> <p>(5) <u>The methods and procedures proposed by the applicant are appropriate to achieve the goals of the proposed activity, especially in relation to the potential effects of the proposed activity on Sanctuary resources and qualities;</u></p> <p>(6) <u>The proposed activity will be conducted in a manner compatible with the primary objective of protection of Sanctuary resources and qualities, considering the extent to which the conduct of the activity may diminish or enhance Sanctuary resources and qualities, any potential indirect, secondary, or cumulative effects of the activity, and the duration of such effects;</u></p> <p>(7) <u>The proposed activity will be conducted in a manner compatible with the value of the Sanctuary as a source of recreation and as a source of educational and scientific information, considering the extent to which the conduct of the activity may result in conflicts between different users of the Sanctuary and the duration of such effects;</u></p> <p>(8) <u>It is necessary to conduct the proposed activity within the Sanctuary;</u></p>	<p>Permit Procedures and Issuance Criteria.</p> <p>Same as Proposed Action</p>

Table 2.1-1, Page 8 of 9

**Table 2.1-1
Regulatory Alternatives Considered for the CINMS Management Plan Update (Continued)**

No Action (Status Quo)	<p align="center">Proposed Action</p> <p>Underlined (new) and struckthrough (deleted) text show differences from No Action (Status Quo)</p>	<p align="center">Alternative 1</p> <p align="center">(bold text is different from Proposed Action)</p>
	<p><u>(9) The reasonably expected end value of the proposed activity furthers Sanctuary goals and purposes and outweighs any potential adverse effects on Sanctuary resources and qualities from the conduct of the activity; and</u></p> <p><u>(10) Any other matters the Director deems appropriate do not make the issuance of a permit for the proposed activity inappropriate.</u></p> <p><u>(d) Applications.</u></p> <p><u>(b)(1) Permit a</u>Applications for permits shall should be addressed to: <u>the Director, Office of Ocean and Coastal Resource Management National Marine Sanctuaries;</u> ATTN: Manager, Channel Islands National Marine Sanctuary, 113 Harbor Way, Santa Barbara, CA 93109.</p> <p><u>(2) In addition to the information listed in 922.48(b), all applications must include information the Director needs to make the findings in paragraphs (b) and (c) of this section.</u></p> <p><u>(e) In addition to any other terms and conditions that the Director deems appropriate, a permit issued pursuant to this section must require that the permittee agrees to hold the United States harmless against any claims arising out of the conduct of the permitted activities.</u></p>	

Table 2.1-1, Page 9 of 9

3 AFFECTED ENVIRONMENT

3.0 AFFECTED ENVIRONMENT

The Channel Islands and surrounding ecosystems are unique and highly valued, as demonstrated by, for example, several national and international designations. In 1980 the United States designated both the Channel Islands National Marine Sanctuary, and the Channel Islands National Park. In addition, the United Nations Educational, Scientific and Cultural Organization's (UNESCO) Man and the Biosphere Program designated the Sanctuary as a Biosphere Reserve in 1986. This area is characterized by a unique combination of features including: complex oceanography, varied bathymetry, diverse habitats, remarkable biodiversity, rich maritime heritage, remote yet accessible location, and relative lack of development. These features yield high existence values as well as human use values for research, education, recreation, and commerce.

This section defines the CINMS Management Plan Update Study Area, and describes the affected environment within that Study Area in five sub-sections:

- 3.1 Marine Ecosystems introduces the basic concept of a marine ecosystem, which provides context for the remaining four sub-sections;
- 3.2 Physical Environment describes the geology, oceanography, and meteorology within the Study Area;
- 3.3 Biological Environment describes the Study Area in terms of bioregions, biotic communities, coastal watersheds, and coastal processes, as well as select relevant regulatory information;
- 3.4 Maritime Heritage Resources describes the cultural and historic components of maritime heritage resources in the Sanctuary and Study Area;
- 3.5 Human Uses describes activities that occur within the Study Area, such as those pertaining to: oil and gas, fiber optic telecommunications cables, vessel traffic and harbors, contaminant sources, introduction of introduced species, fishing, marine bioprospecting, nonconsumptive recreation and tourism, Department of Defense activities, and research and education, along with select relevant regulatory information.

The Study Area, within which the current CINMS boundary lies, is shown in Figure 1.2-2. The Study Area begins on the coast north of Point Sal, at 33.00 degrees north (N) latitude, 120.64 degrees west (W) longitude. The Study Area then takes the following progression:

- West to 35.00 degrees N, 121.17 degrees W;
- South to 34.33 degrees N, 121.17 degrees W;
- East to 34.33 degrees N, 120.67 degrees W;
- South to 33.67 degrees N, 120.67 degrees W;
- East to 33.67 degrees N, 119.17 degrees W;
- South to 33.33 degrees N, 119.17 degrees W;

- East to 33.33 degrees N, 118.83 degrees W; and
- North to 34.02 degrees N, 118.83 degrees W.

Within the Study Area the Sanctuary consists of an area of approximately 1243 square nautical miles (NM) of coastal and ocean waters, and the submerged lands thereunder, off the southern coast of California. The Sanctuary boundary begins at the Mean High Water Line of and extends seaward to a distance of approximately six NM from the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (the Islands). While the proposed regulatory changes pertain to the current CINMS boundary, outside influences within the Study Area are also discussed to provide the background necessary to understand the relationship between the dynamics of the marine environment and successful management of the CINMS.

Additional information about biological and maritime heritage resources can be found at Appendix C. Also, a comprehensive source of information about the physical environment, habitats, invertebrates, marine plants, fish, seabirds, marine mammals, and other resources found within the CINMS is found in *Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document* (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html.

3.1 MARINE ECOSYSTEMS

3.1.1 Introduction

The NMSA at 16 U.S.C. 1431(a)(3) states that “while the need to control the effects of particular activities has led to enactment of resource-specific legislation, these laws cannot in all cases provide a coordinated and comprehensive approach to the conservation and management of the marine environment”. As a consequence, one of the management priorities for the CINMS is “to maintain the natural biological communities in the national marine sanctuaries, and to protect, and, where appropriate, restore and enhance natural habitats, populations, and ecological processes” (16 U.S.C. 1431(b)(3)). This management priority requires a broad and comprehensive approach to resource protection. Such an approach brings a focus on large-scale, ecosystem level protection and management, which is unique *vis-à-vis* the various agencies and laws directed at managing single or limited numbers of species or specific human activities within the ocean.

An “ecosystem” is commonly defined as “a unit of land or water comprising populations or organisms considered together with their physical environment and the interacting processes between them” (U.S. Navy 2000). Marine ecosystem management is sensitive to the spatial occurrence, form, dynamic nature, and extent of biophysical processes and human activities and uses that affect marine life. Overall, marine ecosystems include ecological links and relationships between oceanographic processes, such as currents and eddies, and biology and climate-related factors (McGinnis 2000).

3.2 PHYSICAL ENVIRONMENT

The CINMS and Study Area lie within the northern portion of the southern California bight (SCB). The SCB is formed by a physically defined transition in the California coastline wherein the north-south trending coast begins to trend east-west. The SCB extends from Point Conception, California, to Punta Banda, south of Ensenada, Baja California, Mexico (Dailey *et al.* 1993).

3.2.1 Geology/Oceanography

The geologic resources of an area consist of formational, depositional, and volcanic rocks and the soil derived from these sources. Geologic resources can also include unique landforms, tectonic features, and fossils. In coastal and marine settings, sediments are considered a part of the geologic resources of the area. These geologic features can have economic, scientific, and recreational value.

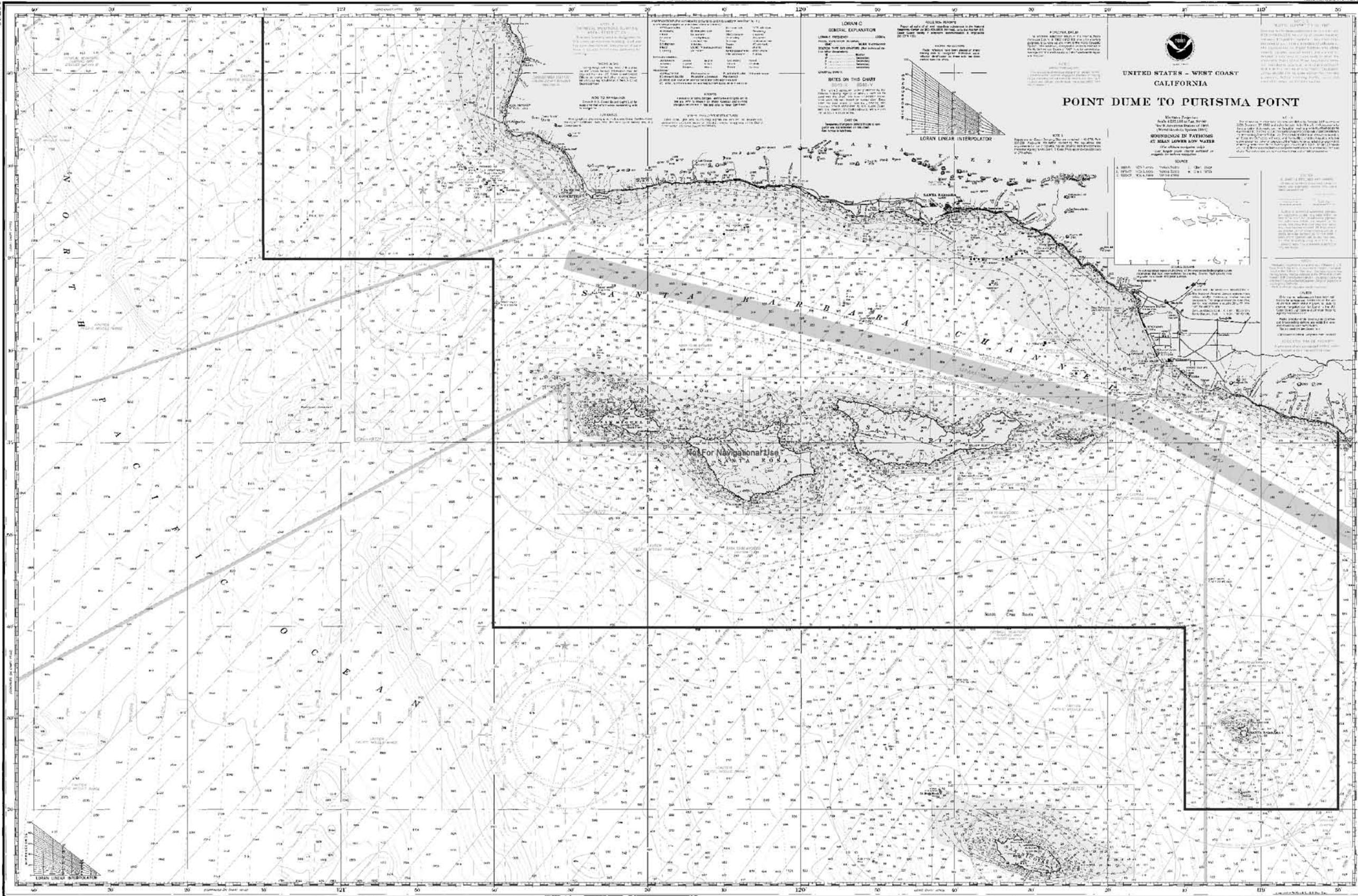
Figure 3.2-1 shows the geologic features of the Study Area. The four Northern Channel Islands (San Miguel, Santa Rosa, Santa Cruz, and Anacapa) parallel the east-west trend of the coast and vary from about 13 to 25 miles offshore. Santa Barbara Island lies about 40 miles south of Point Mugu, California. These islands are all located within a unique oceanographic region known as the Continental Borderland (Norris and Webb 1990).

The Continental Borderland is the section of offshore California between Point Conception and Punta Banda in Baja California (Mexico). Continued large-scale overriding of the North American Plate by the Pacific Plate in southern California caused movement along the San Andreas Fault System (Dailey *et al.* 1993). The Continental Borderland, with its wide shelf and series of laterally shifted blocks, resulted from this movement. It extends seaward for up to 300 miles (Dailey *et al.* 1993). Unlike most wide continental shelves that consist of gently sloping platforms interrupted by low banks and occasional canyons, the Continental Borderland is a region of basins and elevated ridges. The Channel Islands are the portions of the ridges that rise above sea level. The highest point in the Channel Islands is Picacho Diablo on Santa Cruz Island, with an elevation of 2,450 feet (747 meters).

Basin and trough slopes account for 63 percent (19,210 square miles) of the borderlands area (Norris and Webb 1990). Basin and trough floors represent 17 percent of the total area (5,120 square miles), while the islands comprise only 1.1 percent of the total area (340 square miles). The Santa Barbara Basin, oriented east-west in parallel with the coastline and the islands, lies between the islands and the mainland, and is approximately 1,650 feet (500 meters) deep. The remaining basins trend northwest. The basins nearest the mainland are the shallowest and have the flattest floors and thickest sediment fill. The northwest-trending basins range in depth from 1,650 to 8,250 feet (500 to 2,500 meters). The seaward edge of the Continental Borderland is the Patton Escarpment, a true continental slope that descends 13,200 feet (4,000 meters) to the deep ocean floor (Norris and Webb 1990). Figure 3.2-1 shows the bathymetry of the Study Area.

There are at least 32 submarine canyons in the Continental Borderland. Along the mainland coast, there are six prominent canyons thought to be related to the modern shoreline. Other coastal canyons appear to be related to the shoreline and lower sea levels during the Ice Age that ended approximately 12,000 years ago (Norris and Webb 1990). There are also canyons cut into offshore basins in the region (Dailey *et al.* 1993).

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UNITED STATES - WEST COAST
CALIFORNIA
POINT DUME TO PURISIMA POINT



LOTRAN-C
GENERAL EXPLANATION
LOTRAN-C OVERPRINTED
SOUNDINGS IN FATHOMS
AT MEAN LOWER LOW WATER

**SOUNDINGS IN FATHOMS
AT MEAN LOWER LOW WATER**



LOTRAN LINEAR INTERPOLATOR

CINMS EIS STUDY AREA
GEOLOGIC FEATURES AND
BATHYMETRY

Tetra Tech, Inc.
4213 State Street, Suite 100
Santa Barbara, CA 93110-2847

TCH	DATE	DRAWN BY	FILENAME	FIGURE NO.
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3.2.1.1 Sediment Transport

Sediments deposited in the offshore region include sand, silt, clay, and biogenic particulates (aggregates of planktonic origin) (Dailey *et al.* 1993). Sand, silt, and clay are discharged by rivers during the winter rainy season. Waves carry the sand in shallow suspension along the shore within the beach and inshore zone. Periodic strong storms produce long period swells and turbulence, which move the sand offshore to the inner and central shelf. Nearshore submarine canyons intercept much of the transported sand. Lack of turbulence in these deeper waters prevents these sediments from being re-suspended and silt and clay slowly settle out as the water circulates through a general pattern. The pattern of surface water circulation in the Channel Islands region tends to move fine suspended sediment into the Santa Barbara Basin from the California Current System to the west and through the Anacapa Passage to the southeast. As a result, the rate of silt and clay deposition in the Santa Barbara Basin is high (Dailey *et al.* 1993). Biogenic particulates represent 20 percent of the borderland sediments (Dailey *et al.* 1993). Unlike the sediments discharged seasonally by rivers, the biogenic particulates are produced continually, although seasonal blooms of algae increase their rate of production. Borderland sediments also include carbonate, opaline silica, and other organically derived matter (Dailey *et al.* 1993). A thick blanket of this sediment covers most of the borderland (Norris and Webb 1990).

The morphology of the SCB includes 12 major offshore basins. All of the basins are completely enclosed at some depth and semi-enclosed at shallower depths. Thus the region includes time-variable circulations characteristic of enclosed basins as well as fluctuating flows over the sills between the basins (Dailey *et al.* 1993).

The central bottom waters of the Santa Barbara Basin are anoxic, or oxygen depleted, meaning the concentration of dissolved oxygen in the water is less than 0.1 milliliter per liter (ml/L) (Dailey *et al.* 1993). The bottom waters entering the basin over the western sill (on the west end of the Santa Barbara Basin) also have a low oxygen content. In addition, organic carbon content increases with the increase of clay. As the organic material decays, it consumes oxygen faster than it can be replaced. Oxygen availability is the major factor controlling benthic communities in the Santa Barbara Basin. Anoxic central basin bottom waters are considered to be the source conditions for petroleum generation. In the geologic past, similar environments formed the oil-bearing black shales found extensively in both ocean floor and continental stratigraphies (Dailey *et al.* 1993).

3.2.1.2 Geologic Structure

The basins and ridges of the Continental Borderland are believed to have been formed by large-scale synclinal (strata bending upward away from the bed) and anticlinal (strata bending downward away from the crest) folding (Norris and Webb 1990). Some of the ridges, such as the Santa Rosa-Cortes Ridge, appear to be antiforms, or anticline-like structures in which the stratigraphic sequence is not known (Norris and Webb 1990). The four northern Channel Islands form an east-west mountain chain along the southwest border of the Transverse Ranges physiographic province (Weigand *et al.* 1994). The island chain appears to be a highly faulted, east-west trending anticlinorium (Weaver *et al.* 1969). The Transverse Ranges are unusual because of their topography, and the faults and folds that produce them, are oriented east-west. Within the last 17 million years, the Transverse Ranges rotated clockwise 90 degrees or more, to arrive in their unique orientation (Sorlien 1994). A thin sheet of upper-plate western Transverse Range crust separated from the northwest-southeast trending Peninsular Ranges that run from southern California south to Mexico, and was transported above sub-horizontal detachment faults (Sorlien 1994). Santa Rosa and Santa Cruz Islands are at the end of this rotating sheet, and were located west of San Diego before the rotation began. There is evidence that the rotation is still continuing (Sorlien 1994).

There are about 30 principal, east-west trending faults in the Channel Islands area (Norris and Webb 1990). Santa Cruz Island and Santa Rosa Island are both bisected by east-west trending faults that continue offshore. These two faults interconnect with the southern frontal faults of the western Transverse Ranges further east, such as the Dume, Malibu Coast, and Santa Monica faults, and form a part of a 200-kilometer-long fault system extending from Pasadena to San Miguel Island. The Channel Islands Fault Zone, a major fault system, lies beneath the Santa Barbara Channel north of Santa Cruz Island (Sorlien 1994).

3.2.1.3 Rocks

The oldest rocks in the region are metamorphic rocks of the Jurassic period (208 to 144 million years ago). These include the Santa Monica slate and the Santa Cruz Island schist. Rocks of the Franciscan subduction complex are also thought to underlie the Continental Borderland (Norris and Webb 1990). The late Jurassic to early Cretaceous Franciscan complex includes greenish-gray graywacke (sandstones), shales, chert, limestone, and fragments of ophiolite sequences. The basement rocks in the region are overlain by sedimentary Cretaceous and Cenozoic age rocks (Paleocene, Eocene, and Miocene). San Miguel Island has outcrops of late Cretaceous marine sandstone and shale. Paleocene marine sandstone occurs on Santa Cruz and San Miguel Islands. Eocene rocks are found on southwestern Santa Cruz Island, Santa Rosa Island, and San Miguel Island. The Miocene rocks are the youngest (23.5 to 5 million years old) rocks in the region and they are exposed on all four of the northern Channel Islands.

Miocene age rocks include the Monterey formation, the San Onofre breccia, and various volcanics. The Monterey formation is composed of deep-water, diatomaceous, dolomitic, and cherty shales, and often contains pockets of bituminous material. The Monterey formation is an important reservoir for gas and oil. The San Onofre breccia is a coarse-grained breccia and conglomerate with prominent clasts of blue glaucophane schist, green schist, gabbro, and limestone. Miocene volcanics include andesitic, diabasic, and basaltic flow, sills, and dikes, many of submarine origin (Norris and Webb 1990). Marine and non-marine terrace deposits of Pleistocene age (1.8 million to 10,000 years old) and younger overlie the Miocene rocks on the Channel Islands (Norris and Webb 1990). San Miguel and Santa Cruz Islands have locally thick marine terrace deposits.

3.2.1.4 Oil and Natural Gas

There are numerous naturally occurring oil and gas seeps in the Santa Barbara Channel (Norris and Webb 1990; Washburn and Clark 1998). The rate of oil seepage from the South Ellwood anticline, located about 3 kilometers offshore in the Santa Barbara Channel, is one of the highest in the world. The seeps are a major source of marine pollution because the oil they release accumulates in large slicks. Ongoing research conducted by the Minerals Management Service (MMS) suggests that 6 tons of oil and 24 tons of hydrocarbon gases are released per day from the South Ellwood anticline (Washburn and Clark 1998). This natural seep releases more hydrocarbon gases than all of the mobile sources (mostly automobiles) in Santa Barbara County. Plumes of dissolved hydrocarbons are transported westward with prevailing currents, including the California Current system, which carries them for hundreds of kilometers (Washburn and Clark 1998).

More than 20 oil fields and several natural gas fields lie beneath the Santa Barbara Channel. Most are close to the mainland, and several are accessed from offshore platforms (Norris and Webb 1990). The first offshore oil field developed in North America was the Summerland field, discovered in 1896. The Dos Cuadras field, a major field by American standards, lies only 1,000 feet (300 meters) below the sea floor southeast of the city of Santa Barbara (Norris and Webb 1990). This field was the source of the extensive Santa Barbara oil spill in 1969. Other oil fields beneath the channel include the Coal Oil Point,

Ellwood Offshore, and Hondo Offshore fields. Just north of Point Conception, the Point Arguello field was discovered in 1981. This major oil field may ultimately recover over 200 million barrels of oil.

The majority of oil and gas development in Southern California between the 1960s through the 1990s took place off the coast of Santa Barbara County. Much of that activity occurred in the Santa Barbara Channel (Norris and Webb 1990).

3.2.2 Meteorology

The Study Area has a Mediterranean climate characterized by mild winters, when most rainfall occurs, and warm, dry summers. The regional climate is dominated by a strong and persistent high pressure system that frequently lies off the Pacific coast (generally referred to as the Pacific High). The Pacific High shifts northward or southward in response to seasonal changes or the presence of cyclonic storms. In its usual position to the west of Santa Barbara County, the Pacific High produces an elevated temperature inversion. Coastal areas are characterized by early morning southeast winds, which generally shift to northwest later in the day. Transport of cool, humid marine air onshore by these northwest winds causes frequent fog and low clouds near the coast, particularly during night and morning hours in the late spring and early summer months.

The most important climatic and meteorological characteristics influencing air quality in the Study Area are the relatively consistent temperature, predominance of onshore winds, topography, and solar irradiance.

3.2.2.1 Wind and Topography

Topography plays a significant role in direction and speed of winds in the Study Area. During the day, the sea breeze (from sea to land) is dominant. The sea breeze is typically northwesterly throughout the year although local topography causes variations in this pattern. During summer months, these northwesterly winds are stronger and persist later into the night. Wind direction reverses in the evening as the air mass over land cools, becomes heavier, and flows down the coastal mountains and mountain valleys back toward the ocean as land breezes (from land to sea). This diurnal "sloshing" can aggravate pollution problems by continually moving the same air mass over pollution sources. This effect is more pronounced during periods when wind speeds and turbulent mixing are low.

The terrain around Point Conception, combined with the change in orientation of the coastline from north-south to east-west, can cause counterclockwise circulation (eddies) to form east of the point. These eddies fluctuate from time to time and place to place, leading to highly variable winds along the southern coastal strip. Point Conception also marks the change in the prevailing surface winds from northwesterly to southwesterly.

In addition to topography, several other factors also affect winds in the Study Area. During the fall and winter months, the region is subject to Santa Ana winds, which are warm, dry, strong, and gusty winds that blow northeasterly from the inland desert basins through the mountain valleys and out to sea. Wind speeds associated with Santa Ana conditions are generally 15 to 20 miles per hour (mph) although they can reach speeds in excess of 60 mph. "Sundowner" winds are a local phenomenon on the coastal strip below the canyons. Similar to Santa Ana conditions, warm, gusty winds blow sometimes with great intensity down canyons toward the sea. However, these winds are local and are caused by land-sea and diurnal temperature variations. Elevation may also affect wind patterns. The winds at 1,000 feet and 3,000 feet are generally from the north or northwest. Southerly and easterly winds occur frequently in winter and occasionally in the summer.

3.2.2.2 Sunlight

Fog occurs along the coast and in inland valleys from late spring to mid-summer and cloudy conditions occur during winter storms. Since sunlight is the driver of the photochemical reactions that produce ozone and other photochemicals, the prevalence of sunlight is yet another contributor to photochemical smog.

3.2.2.3 Air Quality

Atmospheric stability is a primary factor affecting air quality. Atmospheric stability regulates the amount of air exchange (referred to as mixing) both horizontally and vertically. Restricted mixing (that is, a high degree of stability) and low wind speeds are generally associated with higher pollutant concentrations. These conditions are typically related to temperature inversions that cap the pollutants emitted below or within them. An inversion is characterized by a layer of warmer air above the cooler air mass near the ground, preventing pollutants in the lower air mass from dispersing upward beyond the inversion "lid." This results in higher concentration of pollutants trapped below the inversion.

The airflow around the Study Area plays an important role in exacerbating the movement of pollutants. Wind speeds typical of the region are generally light, another factor that tends to cause higher levels of pollution, since low wind speeds minimize dispersion of pollutants.

During Santa Ana conditions, pollutants emitted in Santa Barbara, Ventura County, and the South Coast Air Basin (SCAB, which includes the Los Angeles region) are moved out to sea. These pollutants can then move back onshore to Santa Barbara County (via the Santa Barbara Channel) in what is called a "post Santa Ana condition." They may also become entrained in offshore winds and get transported farther south before coming onshore.

3.2.3 Physical Oceanography

The south-flowing California Current and the north-flowing Southern California Countercurrent (Figure 3.2-2) dominate the mean water circulation in the SCB (Dailey *et al.* 1993). In the Study Area, currents in the Santa Barbara Channel include patterns of warm water from the Southern California Countercurrent and cold water from the California Current. Upwelling often occurs where these currents meet, near the massive headlands of Point Arguello and Point Conception, as well as along much of the California coast, depending on the season. Oceanographic thermal fronts are abundant in the Santa Barbara Channel and form as a consequence of upwelling and of current shear between the two primary currents (Harms and Winant 1998). Near Point Conception, the continental shelf is broad and deflects the south-flowing California Current offshore of the SCB and along the shores of the northern Channel Islands (Brink and Muench 1986).

3.2.3.1 Offshore Ocean Currents

Offshore circulation in the Study Area is a dynamic system resulting from the interaction of large-scale ocean currents, local geography, and the unique basin and ridge topography of the ocean bottom in the SCB. The California Current is the major ocean current moving through the Study Area (Figure 3.2-2). Year-round, this current brings cold, fresh water from the Gulf of Alaska southward down the coast of California. At Point Conception, where the coastline turns east, the California Current moves further offshore as it continues its southward flow. Near the United States-Mexico border the California Current turns east and then north, and flows back up along the coast and into the Santa Barbara Channel. This directional shift creates a large eddy known as the Southern California Countercurrent or the Southern

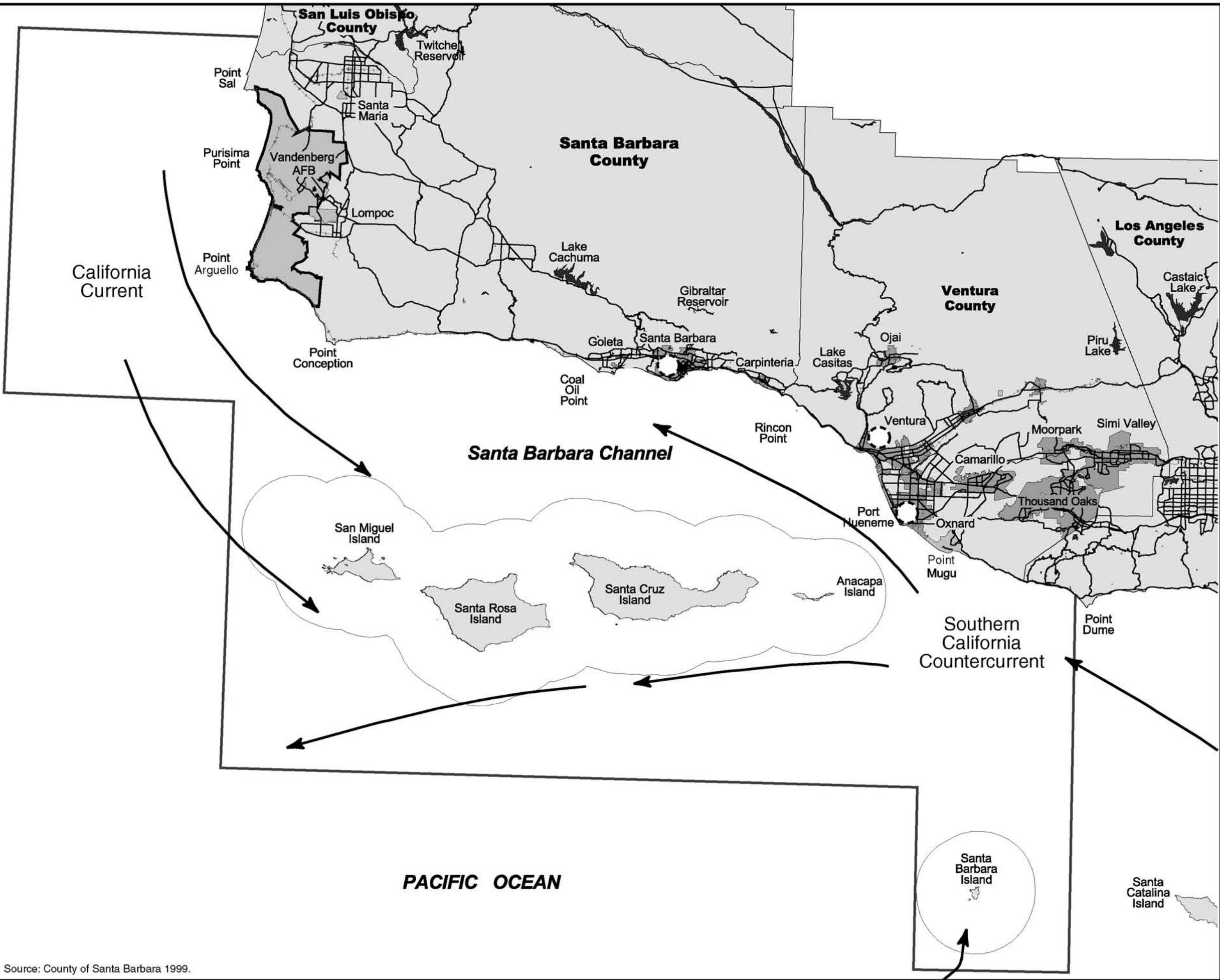
California Eddy (Hickey 2000a). The Southern California Countercurrent moves warm water from southern California northwestward up the coast (Hickey 2000b) At the eastern end of the Channel Islands, the Southern California Countercurrent separates into two parts. One part flows northwestward through the Santa Barbara Channel. The other part flows westward south of the Channel Islands (Hickey Basin Exchange). The California Current and Southern California Countercurrent are both strongest in the summer (Hickey 1993). During the spring, the countercurrent disappears, and surface flow throughout the SCB tends to be southward (Hickey 1993).

Upwelling currents also influence circulation in the Study Area. These currents are the result of prevailing winds and the orientation of the coastline. Due to a process called Ekman transport, wind blowing over water in the northern hemisphere moves the surface water about 45 degrees to the right of the wind direction. Where the wind pushes surface water away from a coastline, deeper water moves up toward the surface to take its place, creating an upwelling current. Along the north-south oriented coast of California, winds blowing from the north move surface water westward, away from the coastline, and create upwelling currents that bring colder water to the surface (San Francisco State University 2000). At Point Conception, where the coastline makes an almost right-angle bend to the east, upwelling essentially ceases. Upwelling is rare along the mainland coast of the Santa Barbara Channel because the headlands at Point Conception shelter the east-west oriented channel from the strong northwesterly winds that generate upwelling (Love *et al.* 1999). Point Conception is the last major upwelling center on the west coast of the United States, and marks a transition zone between cool surface waters to the north and warm waters to the south (Love *et al.* 1999). However, upwelled water from regions north of the SCB appears to enter the western end of the Santa Barbara Channel and move eastward along its southern boundary (Hickey 2000a).

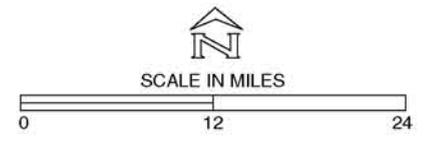
Within the Santa Barbara Channel, a localized cyclonic gyre exists year-round (Hendershott and Winant 1996) with seasonal variations in intensity. In general, cool water enters the Channel from the west and flows eastward along the Channel Islands while warm water enters the Channel from the east and flows westward along the coast. Winant and Harms (2000) identify six distinct patterns; Upwelling, Relaxation, Cyclonic, Propagating Cyclones, Flood East, and Flood West. In the Upwelling pattern, there is a strong south and southeastward flow of cool water from Point Conception and along the north sides of the Channel Islands; a weak warm water current flows toward the northwest along the mainland. In the Relaxation pattern, there is a strong northwestward flow of warm water into the Channel from the east, and a weak inflow of cold water from the west. The Cyclonic pattern is an elongated, closed pattern created when the central eddy is strongest, and there is little flow into the channel from either the west or the east. In the Propagating Cyclones pattern, small, tight circular flow cells form in the center of the Channel and drift toward the west. These four patterns form in spring, summer, and fall, but the cyclonicity is strongest in summer and weakest in winter. In the winter, directional flow patterns form. The winter Flood East pattern consists of a strong eastward flow into the Channel along the coastline, and lesser eastward inflow along the Channel Islands. The winter Flood West pattern has a strong northwestward flow along the coast, and a weaker northwest flow along the islands.

Two opposing forces generate the cyclonic flow patterns: a poleward pressure gradient and an equatorward wind stress (Nishimoto and Washburn 2002). In the warm waters of the SCB, sea level is higher than in the cold, upwelled waters north of Point Conception. This difference in sea level creates a poleward pressure gradient that draws water westward through the channel. Upwelling-favorable winds tend to drive strong eastward flow, opposing the westward pressure gradient. When the effect of wind equals that of the pressure gradient, the cyclonic flow patterns form. Imbalances in the two competing forces create the pattern variations described above.

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- LEGEND**
- ROADS
 - STUDY AREA BOUNDARY
 - RAILROAD
 - LAKES
 - LANDMARKS
 - PLACES
 - SANTA BARBARA CHANNEL ISLANDS
 - COUNTIES
 - CURRENTS



CINMS EIS STUDY AREA CURRENTS

	Tetra Tech, Inc. 4213 State Street, Suite 100 Santa Barbara, CA 93110-2847			
	TC#	DATE	DRAWN BY	FILENAME
10871-01	8/30/05	IGE	GRAPHIC:\CHANNEL ISLANDS\3.1-2currentsnew.ai	FIGURE NO. 3.2-2

Source: County of Santa Barbara 1999.

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Nishimoto and Washburn (2002) found that the eddy circulation in the Santa Barbara Channel extended to depths of at least 650 feet (200 meters), or nearly half the total channel depth, and suggest that persistent cyclonic eddies play an important role in maintaining marine populations through climate changes. Cold water uplifted in the center of the eddy may provide an additional source of nutrients during a shift to a warm-water regime, increasing primary productivity and the amount of food available for fish. Nishimoto and Washburn (2002) found large aggregations of juvenile fishes concentrated in an eddy in the Santa Barbara Channel. The researchers suggest that high food availability and feeding success contributed to faster growth and higher survivorship of these fishes. Nishimoto and Washburn (2002) note that the fishes were entrained in the eddy current in their larval stages and remained there until they passed the juvenile stage, when they grew strong enough to escape the circulating current.

Hickey (2000a) found that the sediments in ocean basins of the SCB are near anoxic to anoxic, and that the anoxic area is increasing. Expansion of the anoxic areas reduces the ability of the basin sediments to support marine life. The high ridges between the basins essentially prevent influx of oxygen-bearing water into the basins, which is important for maintaining oxygen levels within the basins. The events that bring oxygen to the basins are associated with processes in the upper water column above the basin. Strong upwelling and southeastward flow from the Santa Barbara Channel into the Santa Monica Basin appear to drive cold, denser water over the ridges into the basins, where it mixes with the ambient water confined within the basins. Influxes of oxygen-bearing cold water to the basins occur only for a few days at a time, after intervals of several years (Hickey 2000a). An intense coastal upwelling event off Point Conception can cause rapid renewal of the water in this basin. Within the last 40 years, water in the Santa Barbara Channel has overturned several times (Hickey 1993).

3.2.3.2 Waves

Waves in the Santa Barbara Channel are produced by seasonal swells crossing the open ocean, the sheltering effect of Point Conception and the Channel Islands, the variable wind fields arising from the mountainous coastal and island topography, and the complex shallow water bathymetry within the Channel (O'Reilly *et al.* 2000).

Deep water swells from winter storms typically enter the channel from the west or west-southwest, for the most part unbroken by the Channel Islands. West swells produce high waves along the south-facing coastline just south of Point Conception and at the eastern end of the Channel south of Ventura. A massive fan of sediment deposited on the shelf by the Ventura and Santa Clara rivers concentrates much of the wave energy traveling eastward down the channel onto a narrow section of coastline near the Santa Clara River mouth (O'Reilly *et al.* 2000). When the deep water swell originates more from the west-southwest, this focusing zone shifts directly northward into the Ventura area. West swells can also produce large waves at Rincon Point west of Ventura. Wave heights increase along portions of the Channel Islands that border the south side of the Channel (O'Reilly *et al.* 2000). On the north side of Santa Cruz Island, the large extent of sheer coastal cliffs that drop straight into water depths of 33 feet (10 meters) or more are a good wave reflector.

In the summer, deep water swells originate in the south Pacific, and encounter the Channel Islands as they move north toward California. The islands shelter most of the channel and the south-facing coast from summer swells, significantly limiting wave heights. South swells from storms near New Zealand enter the western end of the channel while those originating further east near South America are almost entirely obstructed. South swells travel past Anacapa Island and reach the coast near Ventura and Rincon Point. Rare swells originating from the southeast can reach the coast at Santa Barbara (O'Reilly *et al.* 2000).

3.2.3.3 Water Temperature

Much of the uniqueness of the SCB and the adjacent marine environment north to Point Sal is due to the mixing of water masses from the south-flowing cold California Current and the north-flowing warm Southern California Countercurrent. These complex water movements result in differential temperature, nutrient, and larval recruitment conditions among the islands and along the coast north and south of Point Conception. In addition, prevailing winds periodically push surface water offshore from the Point Conception area, causing upwelling of cold, nutrient-rich water that bathes the northwestern islands, but rarely reaches the southeastern islands. It is difficult to separate the effects of temperature, nutrients, and larval drift on the distribution and abundance of marine life in the Study Area. Because the oceanographic influences typically vary, temperature is the easiest parameter to measure, and temperature clearly has major effects on marine life; it has become the standard means for characterizing northern (Oregonian) versus southern (Californian) biotic assemblages.

Broad-scale sea surface temperatures (SST) obtained from satellite infrared photographs (with ground truth from oceanographic data buoys) provide the best long-term records of concurrent temperature regimes throughout the Study Area. Depending on the depth, season, and particular location, surface temperatures may differ considerably from subsurface values, yet SST do reflect reasonably consistent general temperature relationships (Bernstein *et al.* 1977; List and Koh 1976). Water temperature regimes for nearshore habitats are not completely known. Specific data are available for particular locations, depths, and times. For example, CINP, the Tatman Foundation Channel Islands Research Program, and the University of California, Santa Barbara's Partnership for Interdisciplinary Study of Coastal Oceans (PISCO) Program have had intertidal and subtidal thermistors in place at specific locations in recent years. However, deepwater temperature data are primarily available from periodic California Cooperative Oceanic Fisheries Investigation (CalCOFI) cruises.

Mean monthly SST for each of the Channel Islands, as well as at Point Conception and Los Coronados Islands (near San Diego), for the 18-year period from 1982 to 1999 reveal characteristic trends that confirm the transitional nature of this special biogeographic region (Figure 3.2-3). All ten locations show a generally similar pattern of seasonal fluctuations, with lowest SST from January to March (except for Santa Rosa and San Miguel Islands and Point Conception, where upwelled water flowing southeast from Point Conception causes low SST also in April and May) and highest SST from July to October. Except for the Santa Catalina/San Clemente and San Nicolas/Anacapa island pairs, the locations have consistently separate temperature regimes. North/south SST differences are greatest in August (5.0 degrees Celsius [C]) and least in January (1.6 degrees C). Overall, there is a clear southeast to northwest trend of decreasing surface water temperatures for the 10 representative locations that correlates well with differences in species assemblages (Engle 1994; Murray *et al.* 1980; Murray and Bray 1993; Seapy and Littler 1980; Thompson *et al.* 1993). The warmest areas are Los Coronados (San Diego), Santa Catalina, San Clemente, and Santa Barbara Islands. San Nicolas, Anacapa, and Santa Cruz Islands are intermediate. The coldest regions are Santa Rosa, San Miguel, and Point Conception. If areas north of Point Conception were plotted, they would show incrementally colder temperatures.

The extent to which cold water enters the Santa Barbara Channel is variable (Harms and Winant 1998). In general, while the cold-water mass surrounds the north shores of San Miguel and Santa Rosa Islands, the north shore of Santa Cruz Island is alternately surrounded by the cold-water and warm-water masses. If upwelling is intense, the cold-water mass can reach the north side of Santa Cruz Island and will intrude into the pass between Santa Rosa and Santa Cruz Islands.

Temperature-related oceanographic phenomena influencing marine life at the islands vary considerably over time scales ranging from minutes to decades or more. Many organisms are adapted to withstand

typical short-term fluctuations; however, seasonal or longer trends may kill sensitive species or enhance survival of tolerant species, resulting in profound community effects (Tegner and Dayton 1987; Dayton *et al.* 1992). For long-term perspective, daily surface water temperature records taken at the Scripps Institution of Oceanography pier (La Jolla) since 1920 (the longest consistent data available) reveal remarkable long-term trends that likely occurred in similar fashion in the Study Area (Figure 3.2-4). Notably, the 32-year period from 1944 to 1975 was characterized by cooler than average temperatures, except for the 1957 to 1959 El Niño years. In contrast, the 23-year period from 1976 to 1998 has been warmer than the 78-year mean, with a few minor exceptions. This recent multi-decade, warm-water trend helps explain key community changes documented at the Channel Islands during the 1980s and 1990s, including increased numbers of southern species at the northwestern islands, “disease” epidemics, other die-offs, and sea urchin overgrazing phenomena. The peak 1997–1998 El Niño was immediately followed by cold La Niña conditions in 1999. Only time will tell if this marks the start of a cold-water cycle or is just an aberration in the long warm-water period. El Niño, La Niña and temperature regime shifts are discussed next.

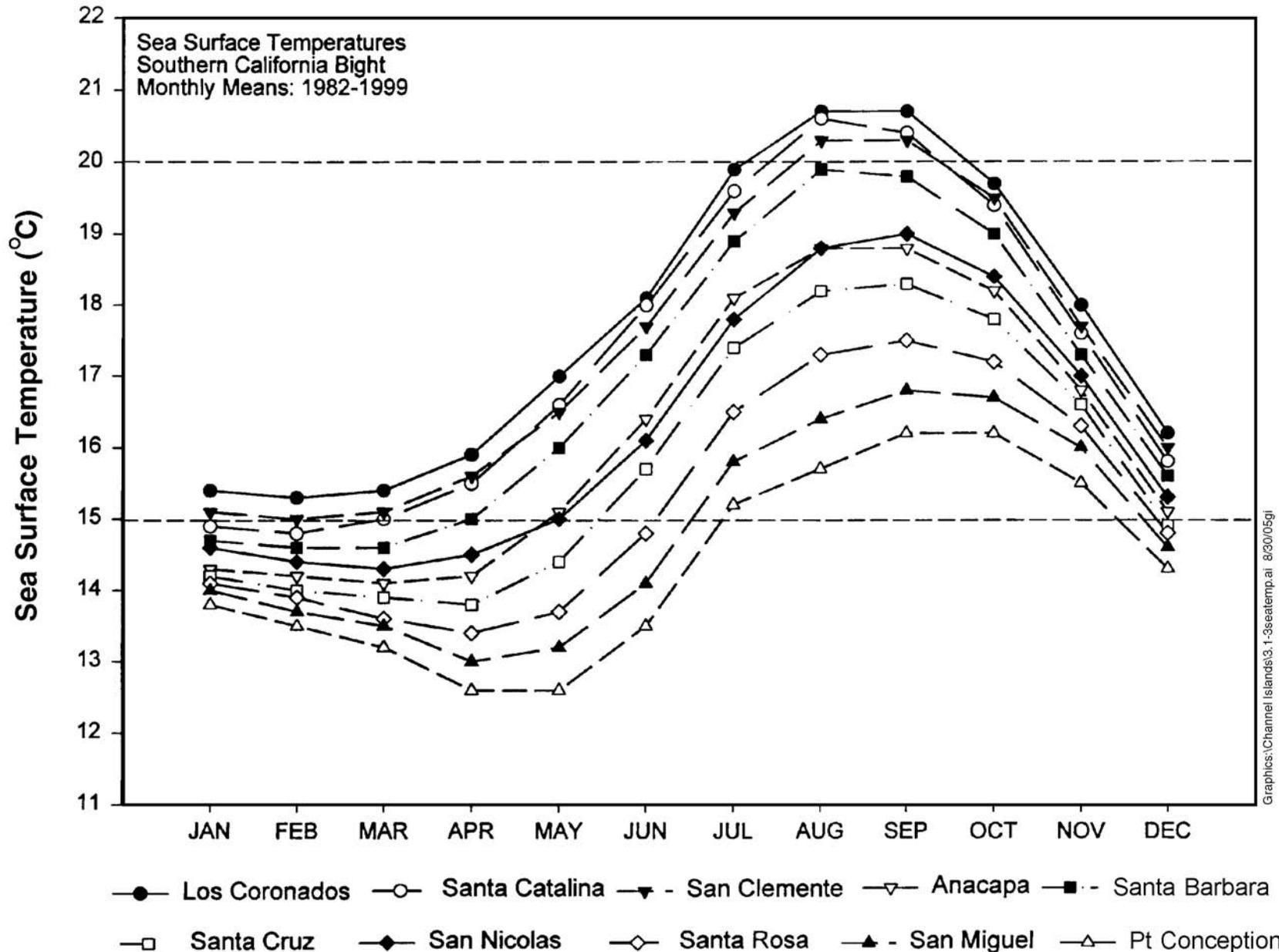


Figure 3.2-3

CINMS STUDY AREA EIS
MONTHLY MEAN SEA SURFACE TEMPERATURE IN THE SOUTHERN CALIFORNIA BIGHT

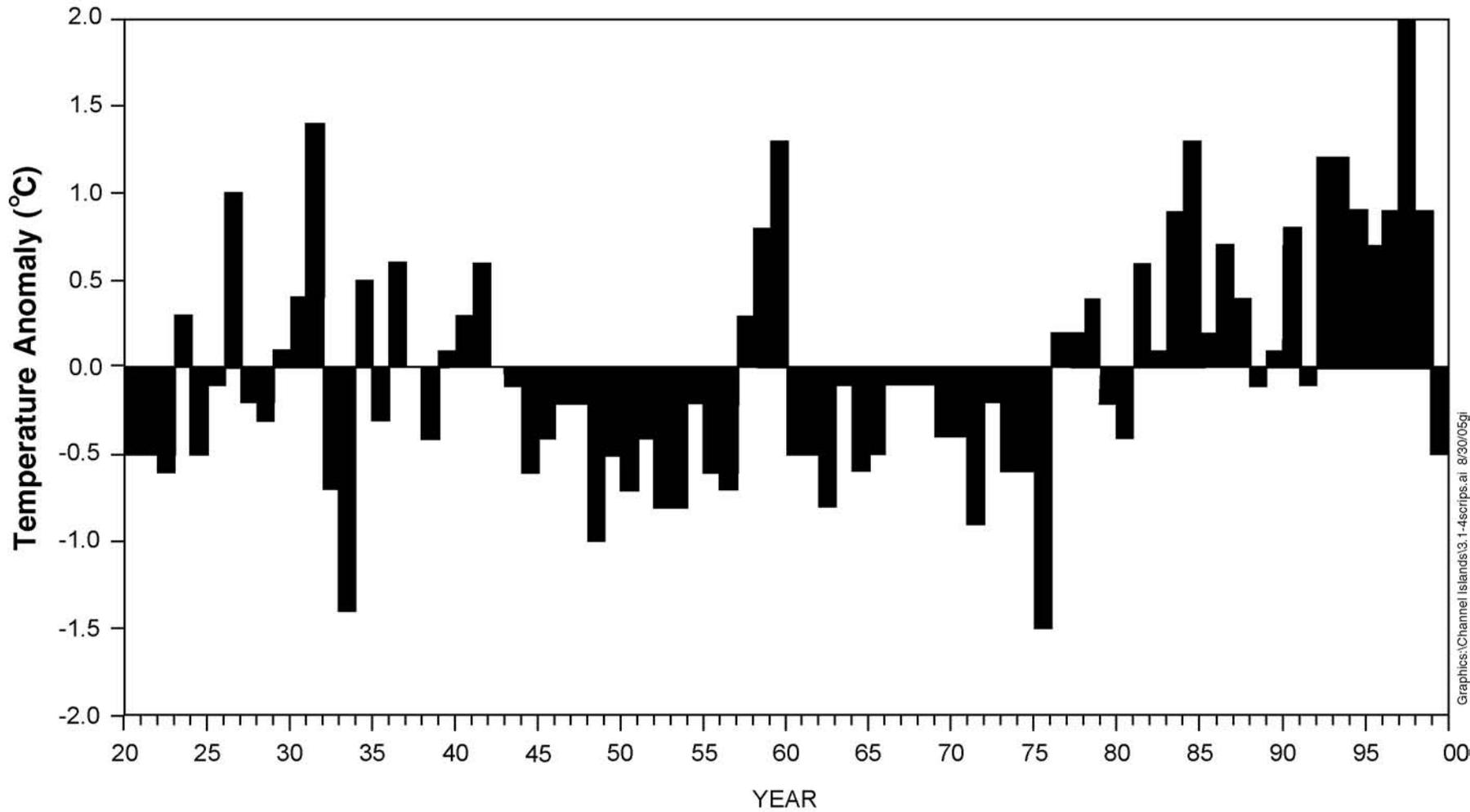


Figure 3.2-4

SCRIPPS PIER SEA SURFACE TEMPERATURE ANOMALIES
(1920 - 1999)

3.2.3.4 El Niño/La Niña

Environmental fluctuation is an important factor influencing the distribution and abundance of marine life of the northern Channel Islands. In the SCB, El Niño and La Niña contribute to environmental fluctuation. El Niño is characterized by a large-scale weakening of the trade winds and warming of the surface layers in the eastern and central equatorial Pacific Ocean. El Niño events occur irregularly at intervals of 2 to 7 years, although the average is about once every 3 to 4 years. They typically last 12 to 18 months and are accompanied by swings in the Southern Oscillation (SO), an interannual see-saw in tropical sea level pressure between the eastern and western hemispheres. During El Niño, unusually high atmospheric sea level pressures develop in the western tropical Pacific and Indian Ocean regions, and unusually low sea level pressures develop in the southeastern tropical Pacific. SO tendencies for unusually low pressures west of the date line and high pressures east of the date line have also been linked to periods of anomalously cold equatorial Pacific SSTs sometimes referred to as La Niña.

Strong El Niño influences, which begin off South America, can eventually influence the climate, resources, and biodiversity of California's marine and coastal environment (Norton *et al.* 1985). A "California El Niño" is characterized by warm sea surface temperatures, a deeper surface mixed layer, a depressed thermocline, nutrient-poor water, greater poleward flow, and an anomalous high sea level (Barber and Chavez 1983; Dayton and Tegner 1990; North *et al.* 1993; Tegner and Dayton 1987). El Niño impacts forests of giant kelp in California in a variety of ways that result in little or no canopy being produced, depending upon the severity of the event. Such impacts also affect kelp forest population dynamics, succession, and competitive interactions among kelp forest species (Tegner *et al.* 1997).

The impact in California depends on the strength of the event. Mild El Niños, which slowed kelp growth, were felt along the coast of California during 1977–1978 and 1992–1993. Especially strong events impacted kelp resources and stopped commercial kelp harvesting off California in 1941, 1957–1959, and 1982–1984. The 1982–1984 El Niño was the largest ever recorded off South America and California (Rasmusson 1984).

Storms associated with the 1982–1984 El Niño also devastated kelp beds throughout California. The effects of this El Niño on giant kelp in southern California were studied by Gerard (1982), Dayton *et al.* (1984), Zimmerman and Robertson (1985), Dean and Deysher (1983), Tegner and Dayton (1987, 1991), and North *et al.* (1993).

Zimmerman and Robertson studied the giant kelp forest at Santa Catalina Island during the 1982–1984 El Niño. They found that deepened isotherms associated with the El Niño resulted in severe nutrient limitation and very low kelp productivity. Frond growth rates were so low that terminal blades formed before the frond reached the surface, eliminating canopy formation. Frond initiation rates were extremely low and resulted in significant reductions in mean plant size. Plants growing above 33 feet were more severely affected by the nutrient limitation than plants growing at 66 feet. These results suggested that nutrient pulses associated with internal waves were critical for survival of giant kelp in nutritionally marginal habitats in southern California (Zimmerman and Robertson 1985).

The relative growth rates of juvenile giant kelp in southern California were substantially reduced during the 1982–1984 El Niño (Dean and Deysher 1983). The lower growth rates were correlated with increased temperature and decreased nitrogen availability. Fertilization of juvenile plants with slow-release nitrogen-phosphorus fertilizer increased their growth rate to levels previously observed when the temperature was low and nutrient levels were high (Dean and Deysher 1983). The limitation in growth of juvenile giant kelp by levels of available nutrients during the El Niño was in contrast to the usual limitation in growth by irradiance during non-El Niño years. There was a shift in the relative importance

of factors controlling growth of juvenile *Macrocystis pyrifera* during the El Niño (Dean and Deysher 1983).

Large-scale, low frequency oceanographic phenomena, such as El Niño or La Niña, play a very important role in kelp forest successional processes, population dynamics, and competitive interactions with understory kelps (Tegner *et al.* 1997). El Niño can drastically reduce the standing crop and canopies of giant kelp in California, resulting in a cessation or reduction of kelp harvesting for many months. Aquaculture, algin, and herring roe-on-kelp industries can all be severely impacted by significant El Niño events in California.

Environmental variations are important contributors to the unexplained distribution of many kinds of fish and shellfish. Consequently, the fishing of and reproductive success of some species are affected by environmental conditions, one of which is water temperature (Radovich 1961).

The effects of water temperature on California's marine flora and fauna can be both beneficial and detrimental. Ocean temperature directly affects the metabolism and survival of adult fish, and the abundance and type of food available. El Niño events have had dramatic effects on the flow patterns of the SCB (Chelton *et al.* 1982). Changes in the flow patterns as well as the resultant changes in rain and weather patterns associated with El Niño have been shown to have a number of biological impacts:

- Population shifts in commercially harvested species, such as squid, rockfish, and lobster;
- Transport of enormous volumes of sediments and suspended materials from the mainland to coastal and offshore waters; and
- Disturbance to critical marine habitats, notably storm and water temperature damage to kelp forests.

El Niño events cause proportional reductions in the growth and reproductive success of organisms within coastal ecosystems. Warm waters and the intrusion of a different water mass associated with El Niño events may change the abundance, species composition, and temporal dynamics of the prey community in local species assemblages. Depending on the nature of an organism's diet and patterns of energy storage and mobilization for reproduction, adult condition and spawning efforts may be adversely affected. Starvation and thermal stress may have direct physiological effects on fecundity, timing of spawning, and egg viability in both fishes and invertebrates, especially if they are sedentary or limited-range species (Bailey and Incze 1985; Barber and Chavez 1983).

It is important to note that marine organisms of the CINMS Study Area adapt within this ecosystem and have developed strategies which allow them to recover under natural conditions (Tegner and Dayton 1987). Some stocks, such as herring, are adapted to living in an environmentally variable coastal zone (Bailey and Incze 1985). Birds and pinnipeds are known to abandon their young so that the adults may use available food for their own survival (Barber and Chavez 1983).

However, the ability of a particular species to recover may be reduced if the El Niño event is particularly severe or prolonged. Early life history stages of organisms are especially vulnerable to the effects of warm waters, altered food production, and changes in transport regimes (Bailey and Incze 1985).

Overexploitation of a particular species may further hamper or prevent recovery (Cushing 1982). Overfishing may cause recruitment failure by either reducing the abundance of certain key species within an ecosystem, or by reducing the adult population size. Consecutive years of poor recruitment increases the likelihood of a total population collapse (CINMS 2001).

Highly migratory or mobile species may be able to avoid the warm El Niño conditions by either migrating further north or into deeper waters. However, bioenergetic costs associated with migration may pre-empt somatic growth and/or gonadal development. Fecundity, timing of spawning, and egg viability may be adversely affected by the weakened condition of adults (Bailey and Incze 1985).

Migration to cooler waters may present opportunities to expand a species' range by colonizing new areas. Successful colonization will depend upon the species' ability to cope with local dynamics like the timing of plankton blooms and current patterns, new interspecific interactions, such as competition and predator-prey relationships, and local conditions once the El Niño conditions subside (Bailey and Incze 1985).

Species more commonly found in tropical waters may migrate to, or be advected into, temperate waters during El Niño events (Squire 1983). For example, red crabs (*Pleuroncodes planipes*), pelagic tunicates, and fishes such as albacore, barracuda, dorado, yellowfin tuna, marlin, and triggerfish have been noted to occur far to the north of their usual range. In general, highly migratory species like yellowtail and some pelagic species such as barracuda and sardines thrive during warm water events. In the case of barracuda and yellowtail, these fish move north into Californian waters in response to the movement of warm water from the south. Sardines spawn when the water temperature is above 55.4 degrees Fahrenheit (13 degrees C). Higher water temperatures probably enhance the reproductive success of sardines. The arrival of new species may introduce new interspecific reactions that may alter the local community structure (Bailey and Incze 1985).

The displacement of species during El Niño events is reflected in depressed commercial catches of temperate-water species such as salmon, northern anchovy, lingcod, sablefish, rockfishes, dungeness crab, market squid, and shrimp (Smith 1985). During El Niño events, cold water species such as anchovy and salmon suffer declines. For anchovies, a warm water event merely signals the lack of preferred food such as plankton. Salmon, however, cannot metabolically withstand substantial increases in water temperature. Thus they will move away from areas of warm water. For those species at or near the bottom of the food chain, such as algae and lower invertebrates, the cessation of upwelling can be fatal. The dependence of these species on the nutrients found in cool upwelled water is well documented (Barber *et al.* 1985; Smith 1985). When the nutrients are depleted, the resulting mortalities and their effects can be felt all along the food chain (Barber *et al.* 1985).

Strong El Niño events are highly correlated with severe storms (Tegner and Dayton 1987). The community structure of kelp forests and other benthic habitats may be significantly altered following storm-induced disturbances. Recovery of plants damaged by storms may be hindered by the warm, nutrient-poor water associated with El Niño events.

3.2.3.5 Temperature Regime Shift

Recent data from extracted cores from the Santa Barbara Channel includes high quality information that can be tracked in increments of close to 50 years. The cores show rapid and extreme shifts in water temperatures during the last 60,000 years (Cannariato and Kennett 1999). These extreme shifts in water temperature are one indication of regime shifts in the marine ecosystems of the CINMS and the SCB. As described earlier, climatic changes from natural and human causes are likely to produce major marine ecosystem disruptions or regime shifts. Regime shifts reflect significant changes in water temperature and in the currents of marine ecosystems (Steele 1998). Changes in water temperature can contribute to changes in the abundance and distribution of marine life and the general spatio-temporal character of marine habitats (McGowan *et al.* 1998).

Marine scientific evidence points to a large-scale persistent biological response to the climate regime shift in the California Current. CalCOFI investigators and others show that large-scale changes, or what is referred to as a regime shift, in the physical and biological processes can lead to change in the distribution and abundance of some marine species. Each regime shift changes the basic nature of marine ecology for several decades at a time (or on the order of several human generations). McGowan *et al.* (1998) state that the last regime shift occurred in 1977. General characteristics of regime disturbance, along with the current low-nutrient regime of the SCB, are described further below in Section 3.2, Biological Environment. It is important to note that despite regime shifts, Cannariato *et al.* (1999) show there has been no extinction of benthic species in the Santa Barbara Channel. This is an important finding given that a number of benthic species have recently declined to the point of being listed as threatened under the federal Endangered Species Act.

3.3 BIOLOGICAL ENVIRONMENT

3.3.1 Bioregions

The confluence of the California Current and the Southern California Countercurrent has been shown to affect the abundance and distribution of marine species (Dailey *et al.* 1993). Murray and Littler (1981) define five distinct biogeographical provinces or bioregions (areas characterized by distinct patterns of species abundance and distribution) across the SCB based on analyses of 21 sites. The Study Area coincides with three biogeographical provinces: (1) the colder Oregonian Province, (2) the warmer California Province, and (3) the transition zone between the two. Point Conception is often identified as marking the transition between the Oregonian and Californian Provinces (Horn and Allen 1978; Murray and Bray 1993; Murray and Littler 1981). However, changes in the province boundaries are influenced by hydrographic conditions of the SCB and climate perturbation (Murray and Bray 1993; Murray and Littler 1981; Seapy and Littler 1980). Depending on the season, the Channel Islands and the CINMS are embedded in one or more of the three biogeographical provinces identified above. San Miguel Island typically lies in the colder waters of the Oregonian Province while Anacapa and Santa Barbara Islands are typically in the warmer Californian Province. The eastern side of Santa Rosa Island and Santa Cruz Island are generally in the transition zone (Horn and Allen 1978).

Numerous studies support the distinctions between these biogeographical provinces. Murray and Littler (1981) show that the marine flora of the island sites near the California Current (San Miguel and Santa Rosa Islands) had much greater likeness to flora north of Point Conception than did the flora bathed principally by the Southern California Countercurrent or those of mixed waters. Other studies of species distribution patterns also suggest the presence of two primary faunal regimes. California fish fauna assemblages may be classified into two groups: those associated with cold-water masses and those associated with warm-water masses (Horn and Allen 1978). Earlier studies by Fitch (1967) of Pleistocene fossil fishes in southern California support the premise that these faunal regimes were consistent through time. Studies of the distribution patterns of shallow water benthic mollusks (Valentine 1966), rocky intertidal assemblages (Kanter 1980; Littler 1980; Murray *et al.* 1980), kelp-bed fishes off the Santa Barbara coast (Ebeling *et al.* 1980), and sandy beaches of the region, including the mainland (Dugan *et al.* 1999), show distinct but interrelated biogeographical provinces. For example, because most nearshore fishes, invertebrates, and macroalgae have planktonic phases in their life histories, the spatial and temporal variability of their recruitment is linked to physical oceanographic processes, such as currents, eddies, and upwelling (Roughgarden *et al.* 1988).

3.3.2 Biotic Communities

3.3.2.1 Introduction

A biotic community is defined by the species occupying a particular locality and the interactions between those species. In turn, a biotic community coupled with its associated physical environment is considered an ecosystem. A fundamental way biological communities organize themselves is by food webs. A food web must have primary producers to capture energy from the sun (algae, phytoplankton, vascular plants), a means of energy transfer by feeding, and nutrient cycling between biotic and abiotic environment by excretion, bacteria, fungi, and detritus to provide nutrients back to primary producers. The different habitats of the CINMS are linked by these nutrient cycles and food webs (Dailey *et al.* 1993). Figure 3.3-1 depicts a simplified food web showing linkages between sea lions and other marine life, including fishes, in the CINMS.

As tides and currents move water among the habitats, dissolved and particulate organic matter and nutrients also flow among the diverse habitat areas. Marine organisms from fish and invertebrates to seabirds and marine mammals also move among different habitat areas.

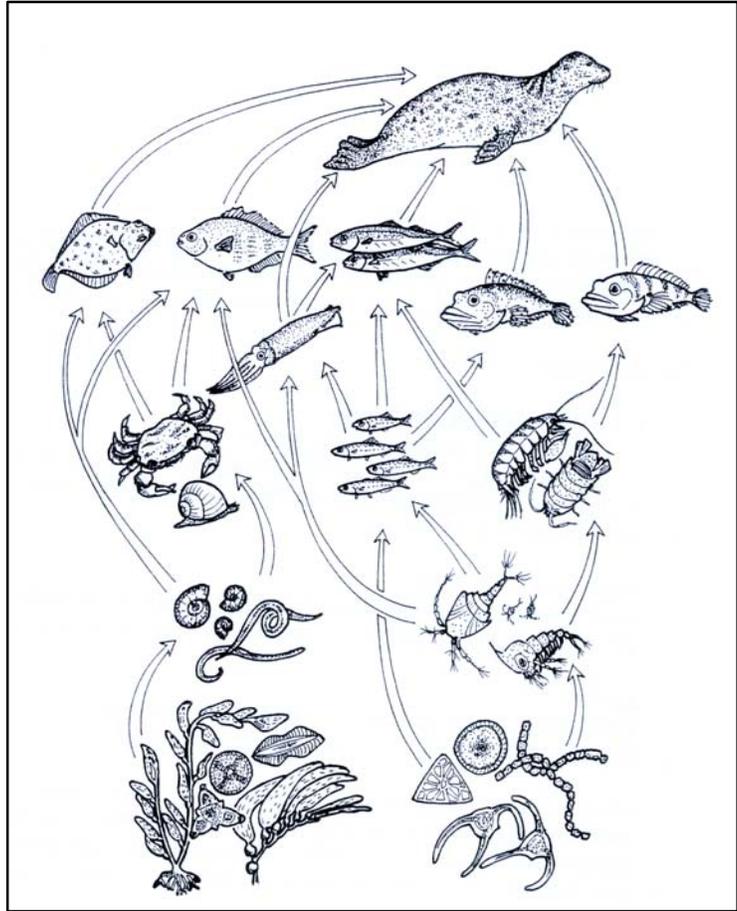


Figure 3.3-1 Simplified Food Web

Source: U.S. Navy 2000.

3.3.2.2 Habitats Within the Study Area

The Sanctuary contains many important and varied physical and geological features including a complex of plateaus, continental slope, gyres, banks, subsea canyons and rocky reefs. The diversity of accentuated bottom relief, abrupt change in depth, and varied substrate provide a spectrum of marine habitats. In summary, the primary habitats found within the study area include kelp forests, surfgrass and eelgrass beds, rocky and sandy intertidal, rocky and sandy nearshore subtidal, deep-water benthic, and pelagic habitats. A detailed discussion of study area habitats is provided in Appendix C, section 1.1, of this DEIS.

Kelp Forests Kelp forests in the Sanctuary are highly productive habitats that provide food, attachment sites, and shelter for myriad invertebrates and fishes. Locations supporting kelp generally have been consistent through time, but the extent of these beds has varied considerably based on environmental conditions such as water temperature and natural predation.

Surfgrass and Eelgrass Surfgrass and eelgrass beds are also highly productive and complex

microhabitats that support a wide variety of marine species. The largest beds of eelgrass in the Sanctuary occur at Smugglers Cove, Canada del Agua, and Prisoners Harbor on Santa Cruz Island and at Bechers Bay on Santa Rosa Island.

Intertidal The intertidal zone comprises a variety of coastal habitats periodically covered and uncovered by waves and tides. Intertidal habitat within the Sanctuary is composed of approximately 94.5 miles of rocky coastline interspersed with approximately 47 miles of sandy beaches (California Resources Agency, CDFG 2002). A wide variety of sedentary invertebrates, including barnacles, limpets, and mussels compete for space with the plants in the intertidal zone which also provides important habitat for fish, seabirds, seal and sea lions.

Nearshore Subtidal Nearshore subtidal habitats include mud, sand, gravel, cobble, and bedrock substrates. Nearshore subtidal rocky habitats at the Islands are widespread, especially high relief volcanic reefs with walls, ledges, caves, and pinnacles. Typical shallow subtidal areas in the Sanctuary contain assemblages of plants, invertebrates, and fishes, with giant kelp dominating. However, many shallow reefs grazed by sea urchins have less giant kelp and greatly reduced species diversity. Many sandy nearshore habitats in the Sanctuary have relatively steep slopes composed of coarse shelly debris. Stable sand habitats with fine grain sediments are generally limited to sheltered coves at canyon mouths, such as those found around Santa Cruz Island.

Deep-Water Benthic Beyond nearshore subtidal depths are deep-water habitats extending from 99 to greater than 660 feet deep. Well over 90 percent of deep-water benthic habitats in the Sanctuary consist of fine sands in shallower portions, grading into silt and clay-dominated sediments in deeper portions (Science Applications International Corporation 1986; Thompson et al. 1993). In addition, deep rock bottoms are often located offshore from major headlands and Islands, and on the highest parts of undersea ridges, banks, and pinnacles. High relief pinnacles and ridges occur in some areas, such as off the northwest end of San Miguel Island.

Pelagic Habitats Water column, or pelagic, habitats consist of discrete portions of ocean waters categorized by variation among multiple factors, such as light penetration, temperature, oxygen concentration, and density. Water column habitats within the majority of the Sanctuary do not extend deeper than the mesopelagic zone (from approximately 660 to 3,300 feet), though the southern reaches of the Sanctuary boundary near the mouth of Santa Cruz Canyon (a submarine canyon between and offshore from southeastern Santa Rosa Island and southwestern Santa Cruz Island) approach bathypelagic depths (from approximately 3,300 to 11,500 feet).

3.3.2.3 Floral and Faunal Assemblages in the Study Area

The Sanctuary's oceanographic and physical features support a great diversity of marine species, many of which are extremely rare and afforded special protection by federal and state law. A detailed description of floral and faunal assemblages in the Study Area is provided in Appendix C, Section 1.2, of this DEIS.

Plankton Plankton, single celled pelagic marine plants (phytoplankton) and animals (zooplankton), form the base of the food web. Many species of plankton inhabit the Sanctuary and marine life is highly dependent on their growth and productivity. Their numbers, biomass, and production vary greatly both spatially and temporally.

Marine Plants Marine plants of the Sanctuary are made up of algae and seagrasses. Diversity of marine plants is greater in the SCB and the Channel Islands than along coastal central California. In the SCB,

there are at least 492 species of algae and 4 species of seagrasses known to occur of the 673 species described for California (Abbott and Hollenberg 1976; Murray and Bray 1993). Giant kelp, surfgrass and eelgrass are marine plants that provide important habitat to numerous other species within the Study Area. In particular giant kelp forests are conspicuous features of the Sanctuary and important not only ecologically, but also recreationally and commercially.

Invertebrates The Channel Islands support a wide variety of invertebrates due to their transitional location between cold and warm biogeographic provinces and diversity of substrates. The total number of species may well be in excess of 5,000, not including microinvertebrates (Smith and Carlton 1975; Straughan and Klink 1980). Marine invertebrates may be benthic (bottom-dwellers) or pelagic, and may range in size from little known microscopic forms (micro-invertebrates) to the more common larger organisms (macro-invertebrates). Select invertebrates in the Sanctuary include multiple species of corals, prawns, spiny lobster, crabs, sea urchins, sea cucumbers, sea star, abalone, nudibranchs, scallops, mussels, squid, clams, barnacles, snails, salps, tunicates, jellyfish, sea slugs, and anemones. White abalone is protected by the ESA. Within the Sanctuary highly valuable commercial fisheries for squid, sea urchin, and lobster occur.

Fish About 481 species of fish inhabit the Southern California Bight (Cross and Allen 1993). The great diversity of species in the area occurs for three principal reasons: 1) the ranges of many temperate and tropical species extend into and terminate in the SCB; 2) the area has complex bottom topography and a complex physical oceanographic regime that includes several water masses and a changeable marine climate (Cross and Allen 1993; Horn and Allen 1978); and 3) the islands and nearshore areas provide a diversity of habitats including soft bottom, rock reefs, extensive kelp beds, and estuaries, bays, and lagoons. Select fishes commonly found in the Sanctuary include: albacore, anchovy (northern), bass (various species), cabezon, California sheephead, California halibut, garibaldi, rockfish (various species), salmon (king), sardine (Pacific), shark (various species), surfperch (various species), swordfish, and white sea bass.

Sea Turtles Four species of sea turtles have been reported in the offshore southern California region: green, loggerhead, olive Ridley, and leatherback (Cordaro 2003). Most information on sea turtle distribution in southern California is based on stranding data. This stranding data indicates that for the Channel Islands area all four species of sea turtle may be found within the Sanctuary at any time of year (Cordaro 2003). All sea turtles are protected by the Endangered Species Act (ESA).

Seabirds Over 195 species of birds use open water, shore, or island habitats in the Southern California Bight (Baird 1990). The Channel Islands region is located along the Pacific Flyway, a major migratory route for birds, and acts as a stopover during both north (April through May) and south (September through December) migrations. The months of June and July are peak months for transient shorebirds (Lehman 1994). The diversity of habitats provided both on- and offshore also contributes to the high species diversity in the region. Sandy beaches provide foraging and resting habitat for a number of shorebirds including Black-Bellied Plover, Willet, Whimbrel, Long-billed Curlew, gulls, and sanderlings. The upland portions of the beach provide kelp deposits that attract invertebrates where Black and Ruddy Turnstones, dowitchers, and other shorebird species forage. Several bird species within Sanctuary region have special status (of concern, threatened or endangered) under federal or state law. The Sanctuary provides important habitat for eight seabirds that have special status under Federal or state law: Ashy storm-petrel, Black storm-petrel, California brown pelican, California least tern, Double-crested cormorant, Rhinoceros auklet, Western snowy plover, Xantus's murrelet.

Marine Mammals There are three marine mammal groups in the Sanctuary: 1) whales, dolphins and

porpoises (cetaceans); 2) seals and sea lions (pinnipeds); and 3) the southern sea otter. All marine mammals are protected under the Marine Mammal Protection Act of 1972 (MMPA). In addition, some marine mammals are protected under the federal and state ESA. Species with special protected status are listed in Section 1.2.7.3 of Appendix C within this DEIS. At least 33 species of cetaceans have been reported in the Sanctuary region (Leatherwood et al. 1982; Leatherwood et al. 1987). Common species found in the Sanctuary include: long-beaked common dolphin, short-beaked common dolphin, Bottlenose dolphin, Pacific white-sided dolphin, Northern right whale dolphin, Risso's dolphin, California gray whale, Blue whale, and Humpback whale. Historically seven species of pinnipeds have been found throughout or in part of the Sanctuary: the California sea lion (common), northern fur seal (uncommon), northern elephant seal (common), Pacific harbor seal (common), Guadalupe fur seal (rare), Steller sea lions (extremely rare), and ribbon seal (extremely rare). The productive waters and relatively undisturbed environment of the Sanctuary provides vital habitat for these pinniped species, offering important feeding areas, breeding sites, and haul outs. Finally, sea otters were common in the Channel Islands until prolonged periods of hunting led to local extinction at the Islands and severe depletion along the mainland California coast. From 1987 to 1990, the USFWS, which has primary jurisdiction over sea otters, translocated 139 otters to San Nicolas Island, though as of 2003 only 33 animals were reported (Sanders 2003). Following the translocation rare sightings of sea otters in the Sanctuary have been reported.

3.3.2.4 Status of Biotic Communities in the Study Area

Communities and ecosystems do not have a preset optimal level to which they invariably return (Noss 1995). These composite biological structures are different from homeostatic systems. When a limit of tolerance, for example, in a marine ecosystem is reached, the ecosystem does not die. Instead, the system reaches a different state with different operating conditions, processes, and ecological structures. The ecosystem's response to ecological disturbance refers to the capacity of an ecosystem to withstand stress and environmental fluctuation. The system possesses integrity if it retains the ability to continue its ongoing change and productive development (Noss 1995).

Scientific evidence shows that ecosystems in the Sanctuary and Study Area are disturbed (CDFG 2002). Based on an analysis of CalCOFI data, Roemmich and McGowan (1995a,b) document large-scale changes in primary and secondary productivity throughout the SCB between 1951 and 1993. Note that this long-term trend in the decline in ecological productivity pre-dates the 1977 warm-water and low-nutrient regime change (discussed above in 3.2.3.5). This evidence suggests that the maintenance of community structure and patterns of native species diversity has changed in accordance with hydrographic perturbations and climate-ocean variability (Hayward *et al.* 1996; McGowan *et al.* 1998).

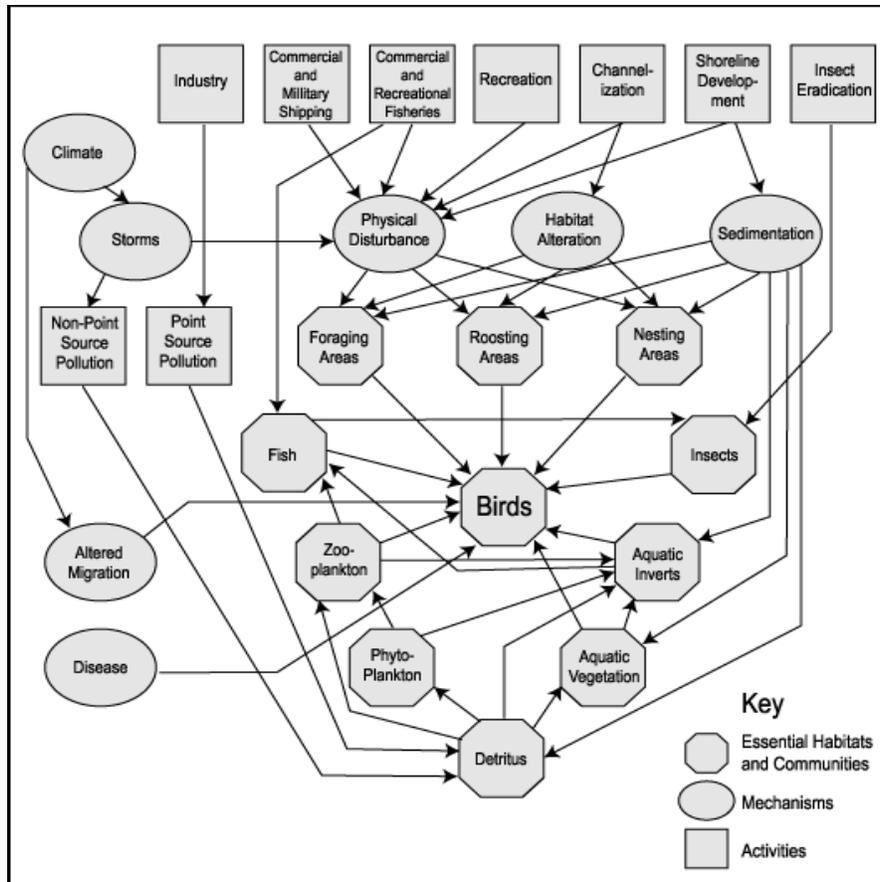


Figure 3.3-2 Activities, Mechanisms, Habitats, and Communities Affecting Coastal Birds

Source: U.S. Navy 2000

Figure 3.3-2 illustrates an example of ecosystem relationships and the complexity of physical, ecological, and human interactions that influence the abundance and distribution of birds, which are indicator species of the health and integrity of coastal marine ecosystems.

A summary of large-scale changes in the SCB as described by marine scientists follows (CDFG 2002; McGinnis 2000):

The Photic Zone (*upper zone of sunlight of the sea, less than 120 meters thick*). Smith and Kaufmann (1994) show a long-term deficit in the supply of food necessary to meet the metabolic demands of the sediment community. The long-term increase in sea surface and upper water column temperatures and physical stratification in the system has resulted in a lower rate of supply of nutrients to the photic zone. This has led to a decrease in productivity and a general decline of zooplankton and other species (e.g., larval fish production, seabirds, kelp production, and a shift in benthic, intertidal community structure). Despite this decline in food supply, the food demand of the deep-benthic sea community remains constant. With the demand on food constant, and the supply diminishing, a net deficit in available food occurs (CDFG 2002).

Macrozooplankton. Since the late 1970s, macrozooplankton volume in the California Current has declined over 70 percent, in concert with increasing sea surface temperatures (McGowan *et al.* 1998;

Roemmich and McGowan 1995a,b). Reduced macrozooplankton has a major impact at higher trophic levels by changing the nature of the food supply.

Fishes and Invertebrates. CDFG data show decreases in landings for several categories of groundfish, sea urchin, swordfish and selected shark species, Pacific mackerel, Pacific herring, California halibut, and market squid (for the period 1997–1998), among others (CDFG 2002). Dugan and Davis (1993) document the general decline in long-term productivity in 19 species of nearshore fishes and invertebrates in California from 1947 to 1986. A study by Love *et al.* (1999) of long-term trends in the SCB commercial rockfish fishery shows a substantial decline from 1980 to 1996, with extremely low catches from 1993 to 1996. In addition, the estimated abundance in streams south of Point Conception for southern steelhead (*Oncorhynchus mykiss*) are probably only on the order of 100 to 300 adults (Pacific Fishery Management Council [PFMC] 1996).

Oceanic Birds. Ecological theory predicts that in a stable ecosystem those species occupying high trophic levels maintain native species diversity and community structure (Paine 1966). Upper trophic level animals such as pelagic birds are indicators of the health of the marine environment (Veit *et al.* 1996). Evidence suggests the abundance of oceanic birds in the region and the SCB has declined steadily since 1988 (Veit *et al.* 1996, 1997). For example, numbers of the sooty shearwater, the most abundant bird in the SCB, have declined by 90 percent. Veit *et al.* (1996) show that the decline in bird biomass reflects considerable biological change within the California Current system. Veit *et al.* (1996, 1997) indicate that ocean warming and climatic events change pelagic bird abundance within the California Current system.

Southern California Kelp. Tegner *et al.* (1997) show a two-thirds reduction in standing biomass since 1957 in southern California kelp forests. Moreover, Tegner *et al.* (1996, 1997), Tegner and Dayton (1991), and Dayton *et al.* (1992) show that kelp forests have suffered great damage since the 1970s.

Global Climate Change. Another large-scale change lies in the increasing frequency of climatic events (McGowan *et al.* 1998).

Marine ecosystem disturbance affects the abundance and distribution of native marine species associated with the Study Area. Further, several species listed as threatened or endangered depend on Sanctuary ecosystems. Many of these species are indicators of ecosystem health. A detailed description of the major biological resources of the CINMS marine ecosystems (specific habitat types and species descriptions, including special-status species) is included as Appendix C of this DEIS and also found in *Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document* (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html.

3.3.3 Coastal Watersheds

There are 24 major drainage systems within the 32,000 square km of the SCB (Saint *et al.* 1996). Of these, 53 percent of the drainage area is controlled by major water retention structures, such as dams and reservoirs.

Freshwater input to the majority of the Study Area is derived from the streams and rivers draining the Transverse Ranges. Two rivers, the Santa Clara River and the Ventura River, drain the eastern portion of the range and provide the majority of the sedimentary input along the southern coastline (Dailey *et al.* 1993; Norris and Webb 1990). The Santa Clara River drains most of southern and central Ventura County and is the largest drainage system in the Transverse Ranges (Norris and Webb 1990). The Santa Clara River extends approximately 75 miles and has been extensively used for urban and agricultural

water supplies (Norris and Webb 1990). The Santa Ynez and Santa Maria Rivers provide major drainages north of Point Conception. The 60-mile-long Santa Ynez River drains the north-facing slopes of the Santa Ynez Mountains and the southernmost Coast Ranges. The Santa Maria River System, which includes the Cuyama and Sisquoc Rivers, drains the San Rafael and Sierra Madre Mountains of northern Santa Barbara County. Table 3.3-1 describes the major watersheds in the Study Area.

**Table 3.3-1
Major Watersheds of CINMS Study Area¹**

Watershed Name	Counties in Watershed	Watershed Area in Square Miles	Watershed Land Use (in order of decreasing areal extent) ¹	Annual Mean Discharge in acre - feet (recording period)
Santa Maria River System (includes Cuyama and Sisquoc Rivers)	San Luis Obispo Santa Barbara Ventura	1,826 ³	National forest/wilderness Agriculture Urban	133,500 (1944-1994) ³
San Antonio Creek	Santa Barbara	135 ²	Military reservation Agriculture Urban	4,420 ² (1956-1996)
Santa Ynez River	Santa Barbara	789 ²	National forest Agriculture Military reservation Urban	80,700 ² (1952-1996)
Santa Barbara Coastal (41 creeks)	Santa Barbara Ventura	375 ⁴	National forest Agriculture Urban	Not available
Ventura River	Santa Barbara Ventura	188 ²	National forest/wilderness Agriculture Urban	47,670 ² (1960-1996)
Santa Clara River	Santa Barbara Ventura Los Angeles	1,577 ²	National forest/wilderness Agriculture Urban	121,200 ² (1928-1996)

Data Sources:

- 1 McGinnis (2001).
- 2 Watershed area and annual mean discharge obtained from U.S. Geological Survey 1996 California Hydrologic Data Report (<http://water.wr.usgs.gov/data/96>), for the farthest downstream gauging station recorded on each watershed. Note that the recording period is not the same for all stations. No data was available in the 1996 report for the Santa Maria River or the Santa Barbara Coastal watersheds.
- 3 Watershed area and discharge data for Santa Maria River System obtained from Bateni and Turner, State of California Department of Water Resources Draft Natural Flow, Santa Maria River 1997.
- 4 Watershed areas obtained from California Rivers Assessment (CARA) 1997. <http://endeavor.des.ucdavis.edu>.

The coastal mainland of the Study Area also includes the San Antonio Creek watershed and 34 small coastal watersheds draining the south side of the Santa Ynez Mountains (NPS 2003). The creeks of these watersheds provide important nutrients to the marine environment but can also carry pollution from agricultural and urban runoff.

3.3.4 Coastal Processes

In the SCB, coastal processes physically link watersheds to wetlands via the delivery of water, sediment, and nutrients to the wetland from the watershed (Dailey *et al.* 1993; NPS 2003). A characterization of coastal ecosystems of southern California is depicted in *Making the Watershed Connection: Wetlands, Watersheds and Regional Planning Efforts of the South Coast* (McGinnis 2001) and by the California Coastal Conservancy (2001).

Within a particular geologic context, water, sediment, and nutrients from the watershed define the type of coastal wetland that emerges (Ferren *et al.* 1995). Wetlands in southern California occur in various ecosystem contexts (e.g., lagoons, rivers, lakes, ponds), but have origins related to several major physical

processes. Wetlands that develop as a result of fluvial processes occur in riparian corridors, such as along the Santa Clara River. Here, riverine and palustrine wetlands occur in proximity to estuarine and marine wetlands when a river reaches the coast, and tidally influenced water regimes bearing ocean-derived salts meet waters and habitats of continental origin.

Several special-status species are found in the CINMS that also depend on the wetlands of the coastal mainland, such as Mugu Lagoon (California Coastal Conservancy 2001). The coastal area between Coal Oil Point and Point Sal comprises only 15 percent of southern California's coast yet holds approximately 50 percent of its remaining rural and natural coastline (NPS 2003). These coastal wetlands are recognized as a "significant biological resource" (Zedler 1982) and "environmentally sensitive habitat" (Santa Barbara County Coastal Plan 1982).

The wetland at Skunk Point, located on Santa Rosa Island is considered to be one of the healthiest remaining in Southern California (Davis 2000).

3.3.5 Regulatory Setting

3.3.5.1 Federal

U.S. Fish and Wildlife Service

There are several laws utilized by the U.S. Fish and Wildlife Service (USFWS) in managing marine and coastal resources. The U.S. Fish and Wildlife Coordination Act gives the USFWS the power to review and comment on federal actions that affect many habitat-related issues, including wetlands and waters protected under the Federal Water Pollution Control Act and Rivers and Harbors Act.

The federal Endangered Species Act (ESA) allows the USFWS to regulate, monitor, and implement programs for protecting the ecosystems upon which fishes, wildlife, and habitat of listed species depend. The ESA also helps enforcement of international treaties and conventions related to species facing extinction.

The federal Migratory Bird Treat Act (MBTA) allows the agency to enforce the prohibition against the taking of migratory birds, their eggs, or their nests. The USFWS has sole authority for coordinating and supervising all federal migratory bird management activities, including enforcement of federal migratory bird statutes regulating the taking of federally protected species (game and non-game) by individuals and federal agencies. The MBTA provides the USFWS opportunity to comment on projects potentially affecting bird species, and their habitats that are not protected under the ESA.

USFWS also has authority to enforce portions of the Marine Mammal Protection Act that deal with sea otters, as well as species not found in the Study Area including walrus and polar bears.

NMFS

The Magnuson-Stevens Fishery Conservation and Management Act authorizes the National Marine Fisheries Service (NMFS) to maintain and conserve fisheries and rebuild overfished stocks. NMFS is also responsible for determining whether projects or activities may adversely impact Essential Fish Habitat zones (those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity) and consulting with project or activity proponents to mitigate for or minimize adverse impacts.

The NMFS Office of Protected Resources (OPR) is charged with the implementation of the MMPA, ESA, and the Fur Seal Act with respect to marine mammal species under NMFS' jurisdiction, including whales, dolphins, porpoises, seals, and sea lions. As part of the MMPA mandate, OPR works in collaboration with the Protected Resources Divisions of the NMFS Regional Offices and Science Centers to develop and implement a variety of programs for the protection, conservation, and recovery of marine mammals. OPR also establishes cooperative agreements with states and Alaska Natives regarding marine mammal resources, identifies important research needs to collect appropriate information for management decisions, and administers the activities of the Marine Mammal Health and Stranding Response Program.

In addition, OPR serves as the principal liaison for NMFS with the Marine Mammal Commission, environmental organizations, industry, other federal and state agencies (including USFWS and the Animal and Plant Health Inspection Service), the academic community, public display institutions, and environmental and animal welfare organizations to meet its mandates under the MMPA. The OPR also administers the national program for display of captive whales, dolphins, porpoises, seals, and sea lions, coordinates with the USFWS on issues concerning the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and administers various exemptions to the take prohibition under the MMPA for the activities below:

- Scientific research;
- Enhancing the survival or recovery of a marine mammal species or stock;
- Commercial and educational photography;
- First-time import for public display;
- Capture of wild marine mammals for public display;
- Incidental take during commercial fishery activities; and
- Incidental take during non-fishery activities.

NMFS OPR is also responsible for implementing the ESA, generally managing endangered and threatened marine species, including anadromous salmonids. NMFS and USFWS share joint responsibility for managing sea turtles. In the Pacific Ocean, NMFS manages 5 species of sea turtles, over 25 evolutionarily significant units of salmon and steelhead, including their critical habitat, white abalone, 7 large whales and several species of pinnipeds. In coordination with the regional offices and science centers, OPR develops policies and regulations to implement the provisions of the ESA with the goal of protecting and recovering endangered and threatened marine and anadromous species and their habitat.

3.3.5.2 State

California Department of Fish and Game

The CDFG administers the California Endangered Species Act and manages sport and commercial fish, wildlife, and aquaculture.

The CDFG regulates the "take" or "possession" of species protected under the California Endangered Species Act and other species under the California Fish and Game Code (e.g., for fishing and hunting).

Seabirds taken in Department-managed hunting programs, for example, include various species of sea ducks. CDFG also continues to be actively involved in restoration and recovery of some native seabird species and other species on the islands.

An established state (CDFG) and federally (USFWS and NMFS) coordinated permit system ensures compliance with numerous applicable state and federal laws affecting the take and possession of other seabirds. Under the provisions of a Memorandum of Understanding with the USFWS, the CDFG may issue scientific collecting permits for various scientific endeavors that advance the conservation interest of seabird resources. In addition, numerous other activities involving the taking or possessing of marine mammals, sea turtles, and seabirds are currently allowed under the California Fish and Game Code, including collection of carcasses for wildlife disease studies, studies of the effects of fishing (bycatch), food habit studies, pollution studies, museum collections, and others. Permitted individuals include agency personnel and designated agents of the agencies, including volunteers.

Recent legislation and plans require that the CDFG develop and implement networks of marine protected areas, or MPAs, in California waters to protect habitats and preserve ecosystem integrity, among other things. Assembly Bill 993 (Shelley), the Marine Life Protection Act (MLPA), was introduced in February 1999 and chaptered in October 1999. The language is now included in Chapter 10.5 of the California Fish and Game Code, Sections 2850–2863. Sponsored by the Natural Resources Defense Council, the bill was supported by conservation, diving, scientific, and educational groups. The purpose of the MLPA is to improve the array of MPAs existing in California waters through the adoption of a Marine Life Protection Program and a comprehensive master plan. The MLPA states that "marine life reserves" (defined as no-take areas) are essential elements of an MPA system because they "protect habitat and ecosystems, conserve biological diversity, provide a sanctuary for fish and other sea life, enhance recreational and educational opportunities, provide a reference point against which scientists can measure changes elsewhere in the marine environment, and may help rebuild depleted fisheries." The master plan requires that recommendations be made for a preferred alternative network of MPAs with "an improved marine life reserve component." The MLPA further states that "it is necessary to modify the existing collection of MPAs to ensure that they are designed and managed according to clear, conservation-based goals and guidelines that take full advantage of the multiple benefits that can be derived from the establishment of marine life reserves." The CDFG is the lead agency charged with implementing the provisions of the MLPA.

A second state law, the Marine Life Management Act (MLMA), enacted on January 1, 1999, establishes a fisheries management system and establishes fisheries management goals for CDFG. With respect to meeting the MLMA's primary goal of sustainability, the CDFG Commission adopted a Nearshore Fishery Management Plan (NFMP), which aims at preventing overfishing, rebuilding depressed stocks, ensuring conservation, and promoting habitat protection and restoration.

State Lands Commission

The California State Lands Commission has responsibility for managing state-owned sovereign lands for the benefit of all people of California for the public trust purposes of waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space, among others. In that regard, the State Lands Commission is supportive of public trust uses consistent with and protective of the fragile resources of the state-owned sovereign lands.

The California State Lands Commission manages and protects the sovereign lands of the state pursuant to section 6301 of the California Public Resources Code. These lands include the beds of California's

naturally navigable rivers, lakes, and streams, as well as the state's tide and submerged lands along California's more than 1,100 miles of coastline extending from the mean high tide line out to 3 NM offshore. The State Lands Commission's policies for managing the state's lands and natural resources are based upon the highest standards of environmental protection, financial responsibility, and the Public Trust Doctrine, which imposes a duty to preserve the public's lands for the use and enjoyment of future generations. The State Lands Commission was created by the California legislature as an independent body, composed of three members: the Lieutenant Governor and State Controller, both statewide elected officials, and the Director of the Department of Finance, a cabinet level officer appointed by the Governor.

3.4 MARITIME HERITAGE RESOURCES

The Sanctuary and Study Area contain a wealth of maritime heritage resources (MHRs) representing as much as 13,000 years of human history. MHRs consist of shipwrecks; aircraft wrecks; material associated with wharves, piers, and landings; prehistoric archaeological sites and their associated artifacts; and paleontological remains. For the purposes of this EIS, this material is divided into two categories: *cultural*, consisting of Native American artifacts, and *historical*, consisting of artifacts from non-Native American cultures. Historic resources span the period from Juan Rodriguez Cabrillo's voyage of discovery (1542 to 1543) to the present. In addition, recently discovered paleontological remains have also contributed to the rich record of the area. In 1994, for example, a relatively complete pygmy mammoth was discovered on a coastal bluff on the north shore of Santa Rosa Island. This discovery represents the most complete pygmy mammoth discovered in the world to date. The discovery suggests a high probability of the existence of submerged paleontological remains within the Sanctuary. Collectively, MHRs of the Sanctuary represent a remarkable cross-section of our regional and national heritage. The following text provides an overview of cultural and historical resources in the Sanctuary and Study Area. A detailed characterization of these resources is provided in Appendix C of this DEIS.

3.4.1 Cultural Resources

Cultural resources found in the Sanctuary represent Chumash Native American cultures and date back to the end of the Pleistocene, approximately 13,000 years before present (B.P.). This is the date associated with the early human remains of a woman ("Arlington Springs Woman") discovered at Arlington Canyon on Santa Rosa Island. These are the oldest human remains yet discovered in North America (Johnson 2000).

The Chumash Indian homeland consisted of villages along the California coast from the present day sites of Malibu to Paso Robles, and in the northern Channel Islands. The Chumash people spoke different but related languages in different parts of the region. The marine component of the Chumash diet consisted of over 150 types of marine fishes (Miller 1988), as well as a variety of shellfish including crabs, lobsters, mussels, abalone, clams, oysters, chitons, and other gastropods (Erlandson 1994). Shellfish were also important to the Chumash economy and material culture. In fact, the Chumash produced the majority of shell bead money used by peoples throughout southern California (Miller 1988).

The abundance of prehistoric Native American Chumash artifacts found in the Santa Barbara Channel has helped archaeologists piece together important Chumash trade networks, fishing practices, and submerged village sites. In addition, archaeological information obtained from middens may help to determine the relative effects of subsistence and environmental fluctuation on prehistoric faunal assemblages in the Santa Barbara Channel (Raab *et al.* 1995). Archaeologists suggest that the Sanctuary may have once been the site of Chumash villages, now submerged by changes in sea level (Howorth and Hudson 1993; Hudson 1976; Hudson and Howorth 1985). During the period when Arlington Springs Woman lived, the

sea level was at least 150 feet lower than it is today, and the northern Channel Islands were joined as one island (Johnson 2000). Further, some submerged artifacts may have been deliberately deposited in the water during religious ceremonies, washed to the sea from shore, or deposited in the water through cliff erosion (Howorth and Hudson 1993; Hudson 1976 and 1979; Hudson and Howorth 1985). Descendants of the Chumash consider the CINMS a special place, still occasionally paddling these waters in tomols (seaworthy wood plank canoes used for crossing the Santa Barbara Channel and for offshore fishing). For more detailed information on historical resources in the CINMS, see App. C, sec. 2.4.

3.4.2 Historical Resources

The historic period in the Study Area dates from early European exploration, starting with Juan Rodriguez Cabrillo's voyage of discovery (1542 to 1543). For hundreds of years, mariners transiting this region have been faced with prevailing winds, extreme weather conditions and natural hazards. An important trade route, the Manila galleon trade, transited this coastline from 1565 to 1815. Sailing east from the Philippines, these galleons would make landfall near Cape Mendocino, California, before sailing southward to Acapulco, Mexico (Wilcox 1991). The small settlement of Santa Barbara became an established coastal trading port during the Spanish (1769–1821) and Mexican occupations (1822–1846). Regional commerce included the hide and tallow trade. Alaskan Aleut Indians, working for the Russian and American fur companies, hunted seals and sea otters for their pelts in the Channel Islands from 1803 to the 1840s (Terrell 1995).

Shortly after American occupation, the 1849 Gold Rush gave rise to the single largest migration of people to California (Delgado 1990). A substantial increase in both steam and sailing ship activity passed through the Santa Barbara Channel during the Gold Rush.

United States Coast Survey teams (renamed the U.S. Coast and Geodetic Survey in 1878) were sent out from the east to the Channel Islands and along the California coast to chart safe anchorages and navigational hazards (Davidson 1858). California ports became a center for international trade, with Western and Eastern economies exploiting natural resources such as seals and whales. Chinese immigrants, working from California-built junks, established some of the earliest commercial fisheries in the Santa Barbara region (Bentz and Schwemmer 2000). From the twentieth century to present, commercial fisheries, commercial freight, military, recreational boating, and oil exploration dominated maritime activities.

Between 1853 and 1980, an inventory of over 140 shipwrecks and aircraft wrecks was documented in the area now encompassed by the CINMS. To date, about 20 of these sites have been located. Shipwrecks in the study area reveal the diverse range of activities and nationalities traversing the Santa Barbara Channel. They include California-built Chinese junks, American coastal traders, vessels engaged in island commerce, and Gold-Rush-era side-wheel steamers. Some examples in the CINMS include the *Comet* (a three-masted coastal lumber schooner that was run aground on San Miguel in 1911 after striking Wilson Rock) and the *Winfield Scott* (a Pacific Mail Steamship Company passenger steamer, which, at full speed, ran aground on Anacapa Island in 1853 with over 400 passengers onboard). The area's American and European shipwrecks depict a remarkable diversity in sail and steam propulsion.

Sanctuary staff have a very active shipwreck reconnaissance program working in partnership with the CINP and Coastal Maritime Archaeology Resources (CMAR) avocational group. Several of the submerged sites have been recorded through the development of underwater maps.

In addition, the Study Area includes a number of land-associated underwater historical sites, both along the mainland shore and offshore islands, including submerged historic remains of landings and wharves.

Submerged artifacts associated with vessel activities, spilled cargoes, and the pioneer oil industry may also exist. Documented settlements include Chute Landing 1880 (Point Sal Landing), Lompoc Landing (Purissima Point), Meherin Wharf (Surf), Wrecker's Wharf (Honda Creek), Sudden Wharf-Rancho Espada (Point Arguello), Lifeboat Station (Point Arguello), shore whaling site (Cojo), Gaviota Wharf, More's Landing (Goleta), Chapala Street Wharf and Stearns Wharf (Santa Barbara), Ventura Wharf, Carpinteria Wharf, and Hueneme Wharf. The offshore island sites include Prisoners Harbor Pier, Scorpion Ranch Pier (Santa Cruz Island), Anacapa Island Landing, Bechers Bay Pier, East Island Pier and Johnson's Lee Pier (Santa Rosa Island), and Cuyler Harbor Pier (San Miguel Island) (Lima 1994).

3.4.3 Regulatory Setting

Within the Study Area, state and federal agencies are mandated to protect historical resources. These agencies have various jurisdictional boundaries. As stated previously, the Sanctuary consists of an area of approximately 1243 square nautical miles (NM) off the southern coast of California. The Sanctuary boundary begins at the Mean High Water Line of and extends seaward to a distance of approximately six NM from the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (the Islands).. The boundaries of Channel Islands National Park include San Miguel and Prince Islands, Santa Rosa, Santa Cruz, Anacapa and Santa Barbara Islands, including the rocks, islets, submerged lands, and waters within one nautical mile of each island (16 U.S.C. sec. 410(ff)). The state's jurisdiction extends 3 NM off the California coast and islands. Also, several state ecological reserves exist within the Study Area; resources within these reserves have additional protection. In addition, the MMS has guidelines to protect historic resources during offshore oil exploration in federal waters.

The protection of historical resources is provided through the following regulations, laws, and orders:

- CINMS regulations (15 CFR Part 922, Subpart G);
- The National Marine Sanctuaries Act (16 U.S.C. 1431 *et seq.*);
- CINP regulations (36 CFR Parts 2 and 7, Resource Protection, Public Use and Recreation, and Special Regulations);
- Archaeological Resources Protection Act (16 U.S.C. 470aa *et seq.*);
- National Historic Preservation Act (16 U.S.C. 470 *et seq.*);
- Abandoned Shipwreck Act of 1987 (43 U.S.C. 2101 *et seq.*);
- Executive Order 11593 (1971);
- California Penal Code Section 622.5: Objects of Archaeological or Historical Interest;
- California Administration Code, Title 14, Section 630(a)(1), General Regulations for Ecological Reserves;
- California Public Law 100-298, implementing federal Abandoned Shipwreck Act; and
- California Native American Resource Protection Act of 2003, Chapter 1.76, Public Resources Code, Section 5097.993-5097.996

The current CINMS regulations prohibit removing or damaging any historical or cultural resource. The NMSP is required to adhere to the Federal Archaeology Program, as established by the NHPA. Federal agencies with land management responsibilities for public lands (including NOAA) must inventory their holdings (Section 110) and ensure mitigation of any federally funded activities that threaten historical and cultural resources on their holdings (Section 106). In 1971, Executive Order 11593 required that all federal agencies create programs to facilitate the protection of cultural resources on their lands. To accomplish such tasks, agencies must have staff trained in archaeological methods and cultural resource management (Terrell 1995). The NPS also has a special provision under Part 7, Resource Protection, Public Use and Recreation for the Channel Islands, 36 CFR 7.84 stating “(b) Wrecks. No person shall destroy, molest, remove, deface, displace, or tamper with wrecked and abandoned water or airborne craft or any cargo pertaining thereto.”

The California Native American Resource Protection Act of 2003 states that it is a misdemeanor for any person to illegally excavate, destroy, injure, or deface a Native American historic, cultural, or sacred site, including any historic or prehistoric ruins, any burial ground, any archaeological or historic site, any inscriptions made by Native Americans at such a site, any archaeological or historic Native American rock art, or any archaeological or historic feature of a Native American historic, cultural, or sacred site. California has title to older abandoned shipwrecks in state waters through the Abandoned Shipwreck Act of 1987. In the case of modern shipwrecks, either the insurance underwriter, in the case of a total loss, or the registered owner has title to the wreck.

3.5 HUMAN USES

The focus of this section is to describe consumptive and non-consumptive human uses that relate to the regulatory changes presented in the Proposed Action and/or Alternative 1, described in Chapter 2.0. Human behavior and activity on land and at sea can dramatically impact coastal marine ecosystems and associated species diversity. A great variety of human uses occurs in the Study Area. For example, the Channel Islands are close to harbors in Santa Barbara, Ventura, and Port Hueneme, as well as Channel Islands harbor in Oxnard. These harbors facilitate visitation to the Islands for numerous recreational and commercial activities. Human use of the Sanctuary is not limited to residents of the Santa Barbara Channel region. Almost 20 percent of those who use California’s coastal areas for recreation, for instance, are interstate or international visitors (California Resources Agency 1997).

3.5.1 Oil and Gas

A comprehensive history of offshore oil and gas development in the Study Area is found in work produced by the University of California, Santa Barbara’s Ocean and Coastal Policy Center (Lima 1994; Molotch 1999a, b, c). These studies show that offshore oil and gas development is typically dependent on onshore facilities. Current onshore facilities prepare crude oil for shipment to refining centers and process natural gas. A characterization of onshore facilities for offshore oil and gas activities is found in *Final California Offshore Oil and Gas Resources Study* (MMS 2000).

This section describes offshore oil and gas activities and their corresponding potential environmental impacts in four phases: (1) exploration, (2) development and production, (3) transfer of oil and/or gas to shore, and (4) platform decommissioning.

3.5.1.1 Offshore Oil Exploration

When an area of the ocean has been identified as having potential oil and gas reserves, geophysical surveys (primarily through the use of seismic technology) are carried out to “type” the geological

formations beneath the seabed. If a seismic survey reveals oil or gas, then exploratory (or “delineation”) drilling is carried out to test the limits or capacity of the field.

Environmental effects of exploratory drilling typically occur over 60 to 90 days (Klee 1999). Although exploratory drilling tends to be short-term, noise and pressure from seismic surveys may still affect the behavioral traits of various marine organisms, such as feeding, mating and avoiding predators. These effects tend to be more pronounced when drilling occurs during natural phenomena such as fish spawning or whale migrations (Klee 1999). A typical marine seismic survey consists of an airgun array, which generates the seismic pulses and hydrophones spaced along a streamer cable just below the surface of the water, which receive the reflected energy from the subsurface formations and transmit data to the vessel, where the data is collected (NOAA 1999a). Underwater sounds produced by seismic operations may be detectable some distance away from the activity. Typical behavior changes in marine mammals that can result from seismic activities include alterations in the surface-dive-respiration cycles, changes in activity or aerial displays, movement away from the sound source, or complete avoidance of the area (NOAA 1999a).

Offshore oil and gas exploration is currently prohibited within the CINMS under the existing regulations, except for leases executed prior to March 30, 1981. Existing leases within CINMS are discussed below in Section 3.5.1.2.

Since 1995, several seismic surveys have been conducted off the Southern California coast. In 1995 Exxon completed a high-energy seismic survey that encompassed 16 leases and covered 117 square miles offshore of Santa Barbara County (County of Santa Barbara Energy Division 2003). This was the first high-energy survey to be completed offshore of Santa Barbara County since 1988.

3.5.1.2 Offshore Oil Development and Production

Federal Activities

Except for the majority of waters within the CINMS (and other National Marine Sanctuaries), no portion of the federal Outer Continental Shelf (OCS) has a permanent moratorium on oil and gas leasing and development (California Coastal Commission 1999). Temporary moratoria have been in place since 1982 (California Coastal Commission 1999). In addition to Congressional moratoria, the Bush (George H.W.) and Clinton administrations issued directives under the OCS Lands Act to restrict leasing of new offshore areas. In 1990, President Bush directed that all areas protected by Congressional moratoria be deferred for leasing consideration until after the year 2002. This deferral included the federal OCS offshore of California. In June 1998, President Clinton also issued a directive under the OCS Lands Act preventing the leasing of any area currently under moratorium for oil and gas exploration and development prior to June 30, 2012. These OCS “presidential deferrals” can be reversed by subsequent administrations.

Offshore oil and gas development has occurred in leased tracts in California waters from the mean high tide line to 3 miles offshore, and in federal waters from 3 to 11 miles offshore. Table 3.5-1 depicts federal offshore oil and gas fields, operators, platforms, installation dates, and platform depths. Figure 3.5-1 depicts the federal offshore oil and gas leases within the Study Area.

Twenty platforms, one island (Rincon Island), and approximately 180 miles of associated pipelines are located in the Study Area. A total of 19 platforms are in federal waters; 1 platform (Platform Holly) and Rincon Island are in state waters (MMS 2000). These structures were installed prior to the passage of NEPA and the Coastal Zone Management Act of 1972. Federal OCS leases within the Study Area yield

approximately 93,205 barrels (one barrel equals 42 gallons) of oil per day and 112,318 million cubic feet of gas per day (County of Santa Barbara Energy Division 2001).

Three pre-existing federal oil and gas leases exist within the CINMS; very small portions of the Port Hueneme Field, the Santa Clara Field, and the Cavern Point Field overlap with the CINMS boundary; however, there are no platforms within the CINMS boundary.

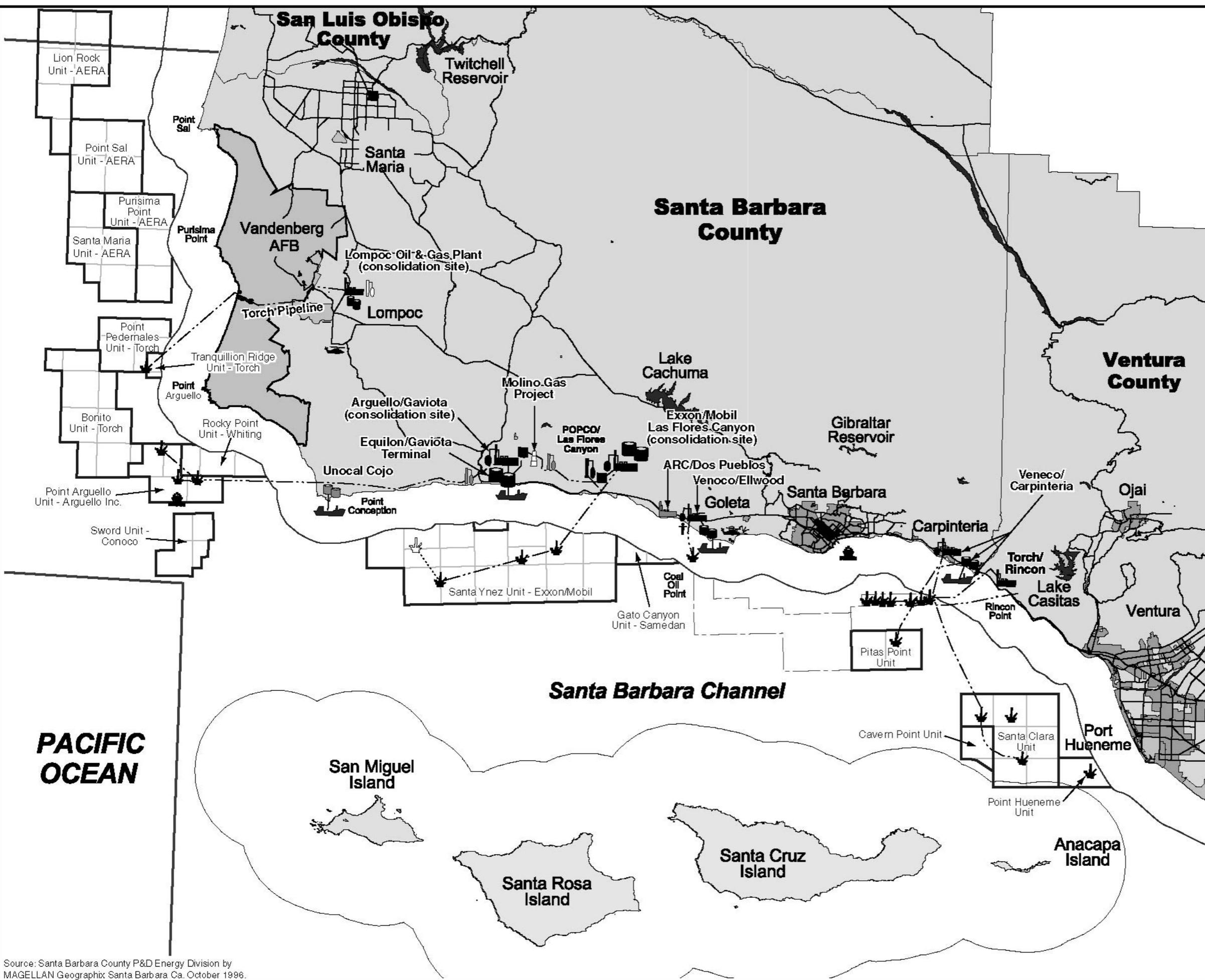
Table 3.5-1

Federal Offshore Oil and Gas Fields, Operators, Platforms, Installation Date, and Platform Depth

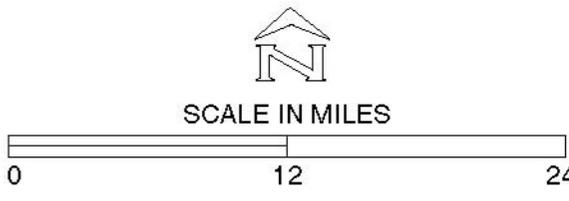
Field	Operator	Platform(s)	Installation Date	Platform Depth (feet)
Port Hueneme	Nuevo	Gina	1980	95
Santa Clara	Nuevo	Gilda	1981	205
	Venoco	Grace	1979	318
Dos Cuadras	Nuevo	Hillhouse	1969	190
	Nuevo	A	1968	188
	Nuevo	B	1968	190
	Nuevo	C	1977	192
Carpinteria	Nuevo	Henry	1979	173
	POOI	Hogan	1967	154
	POOI	Houchin	1968	163
Sockeye	Venoco	Gail	1987	739
Pitas Point	Nuevo	Habitat	1981	290
Hondo	Exxon	Hondo	1976	842
	Exxon	Harmony	1989	1,198
Pescado	Exxon	Heritage	1989	1,075
Point Arguello	Arguello Inc.	Hermosa	1985	603
	Arguello Inc.	Harvest	1985	675
	Arguello Inc.	Hidalgo	1986	430
Point Pedernales	Torch	Irene	1985	242

Source: California Coastal Commission 1999; MMS 2000; POOI-Pacific Operators Offshore Inc.

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- LEGEND**
- ROADS
 - STUDY AREA BOUNDARY
 - RAILROAD
 - LAKES
 - LANDMARKS
 - PLACES
 - SANTA BARBARA CHANNEL ISLANDS
 - COUNTIES
 - EXISTING CINMS BOUNDARY
 - FEDERAL OIL AND GAS LEASE UNITS
 - INDIVIDUAL FEDERAL OIL AND GAS LEASE
 - OIL PLATFORMS
 - OIL PIPELINES



**CINMS EIS STUDY AREA
FEDERAL OIL AND GAS LEASES**

Tetra Tech, Inc.
4213 State Street, Suite 100
Santa Barbara, CA 93110-2847

TC#	DATE	DRAWN BY	FILENAME	FIGURE NO.
10871-01	8/30/05	IGE	GRAPHIC1 CHANNEL ISLANDS 3.4-1oilgasleasnew.ai	3.5-1

Source: Santa Barbara County P&D Energy Division by
MAGELLAN Geographix Santa Barbara Ca. October 1996.

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A brief characterization of each developed oil and gas field follows:

- The Hueneme Field is located in the eastern Santa Barbara Basin approximately 4 miles southwest of Port Hueneme. The field is produced from Platform Gina, which is located approximately 6 miles from shore. This field is in a mature stage of development and production is declining.
- The Santa Clara Field is located in the eastern Santa Barbara Basin approximately 7 miles west of Oxnard. The field is produced from Platforms Gilda and Grace. Gilda is located approximately 10 miles from shore. Grace is located in the eastern Santa Barbara Basin, and is approximately 10 miles north of Anacapa Island. As of August 1998, the MMS indicated that the operator has shut in or plugged and abandoned all the production wells at Platform Grace. The Santa Clara Field is in a mature development stage and total production is declining.
- The majority of the West Montalvo Field is located onshore. The field extends offshore into the California state submerged lands. The field is produced from onshore wells, some of which are directionally drilled under the ocean. There are no platforms or drilling islands used to produce from these offshore reserves; the onshore wells produce from state leases.
- The Dos Cuadros Field is located in the eastern Santa Barbara Basin, approximately 6 miles southwest of Carpinteria. The field is produced from four platforms: Platform Hillhouse, A, B, and C. All platforms are located 6 miles from shore. The field has reached a mature stage and production at most wells is declining.
- The Carpinteria Offshore Field is located in the eastern Santa Barbara Basin, approximately 4 miles south of Carpinteria. The field is developed from both state and federal leases. Platforms Hope and Heidi, which were removed in early 1996, produced from the state leases. Platforms Hogan, Houchin, and Henry produce from federal leases. This field is mature and in an advanced stage of depletion.
- The Sockeye Field is produced from Platform Gail, approximately 11 miles west of Port Hueneme. This field has reached a mature development stage.
- The Pitas Point Field is a gas field and is produced from Platform Habitat, approximately 8 miles from shore. The field is in decline and has a limited future productive life.
- The Hondo Field is produced from Platforms Hondo and Harmony, both of which are in federal waters, approximately 6 miles from shore.
- The Pescado Field is produced from Platform Heritage, approximately 8 miles from Gaviota.
- The Point Arguello Field is located in the southern part of the Santa Maria Basin, approximately 6 miles from shore. Platforms Hermosa, Harvest, and Hidalgo are used to produce the field's oil.

- The Point Pedernales Field is located in the southern Santa Maria Basin, approximately 6 miles west of Point Pedernales. The field is produced from Platform Irene.

State Activities

Commencing in the 1920s, the California state legislature placed most of the California coast off limits to oil and gas leasing and development through a variety of oil and gas “sanctuary” statutes. However, large areas of the coast and submerged lands (0 to 3 miles offshore) remained unprotected. By 1989, the State Lands Commission filled in the remaining gaps in California “sanctuary statutes” and administratively foreclosed the possibility of new oil and gas leasing in state coastal waters, with few exceptions. This administrative sanctuary was later incorporated by the legislature in its comprehensive ban on new oil and gas leasing, through the California Coastal Sanctuary Act of 1994 (California Coastal Commission 1999). Pursuant to this California statute, all state coastal waters, except those under lease on January 1, 1995, are permanently protected from development.

State tide and submerged lands include the area from the mean high tide line seaward to the 3 NM boundary with the federal OCS. State leases in the Study Area yield 1,466 barrels (one barrel equals 42 gallons) of oil per day and 1,249 million cubic feet of gas per day (County of Santa Barbara Energy Division 2001). Figure 3.5-2 depicts the state oil and gas leases in the Study Area. The following describes these oil leases:

- The West Montalvo Field is located at the eastern end of the Study Area. The majority of the West Montalvo Field is located onshore; however, the field extends offshore into the California state tide and submerged lands. The majority of the production in the offshore portion comes from the Colonia Zone of the Sespe formation. The West Montalvo Field is produced from onshore wells, some of which are directionally drilled under the ocean (“offshore” wells). No platforms or drilling islands are used to produce offshore reserves.

The offshore wells produce from state lease PRC-375 and the onshore wells (i.e., those producing from the onshore portion of the field) produce from state lease 3314 (MMS 2000).

- The Rincon Field is located in state waters and is composed of state leases PRC-145, PRC-410, PRC-427, PRC-429, and PRC-1466. Production is from the Pico formation and has essentially no sulfur or hydrogen sulfide in the crude or gas.

As of August 1997, the field was being produced from two locations: a man-made drilling island located approximately 0.6 miles from shore in 45 feet of water on lease PRC-1466 and eight onshore wells drilled into state waters in leases PRC-145 and PRC-410. Rincon Island is a man-made drilling island that was constructed in 1958 and began production in 1960. The island has its own oil/water/gas processing capability and is connected to the mainland by an elevated causeway. The onshore facility that processes the production from the onshore “offshore” wells is located approximately 1.2 miles south of the point where the causeway reaches shore.

Since 1995, the site has changed ownership and the current owner is evaluating methods for increasing production from the field including reworking and redrilling existing wells (MMS 2000). The initiated, proposed, and planned improvements (as of August 1997), may result in production higher than originally projected. However, given the relatively

small level of production from the facility, it is unlikely that the resulting production will have significant impacts on the operation of the facility or the subregion as a whole.

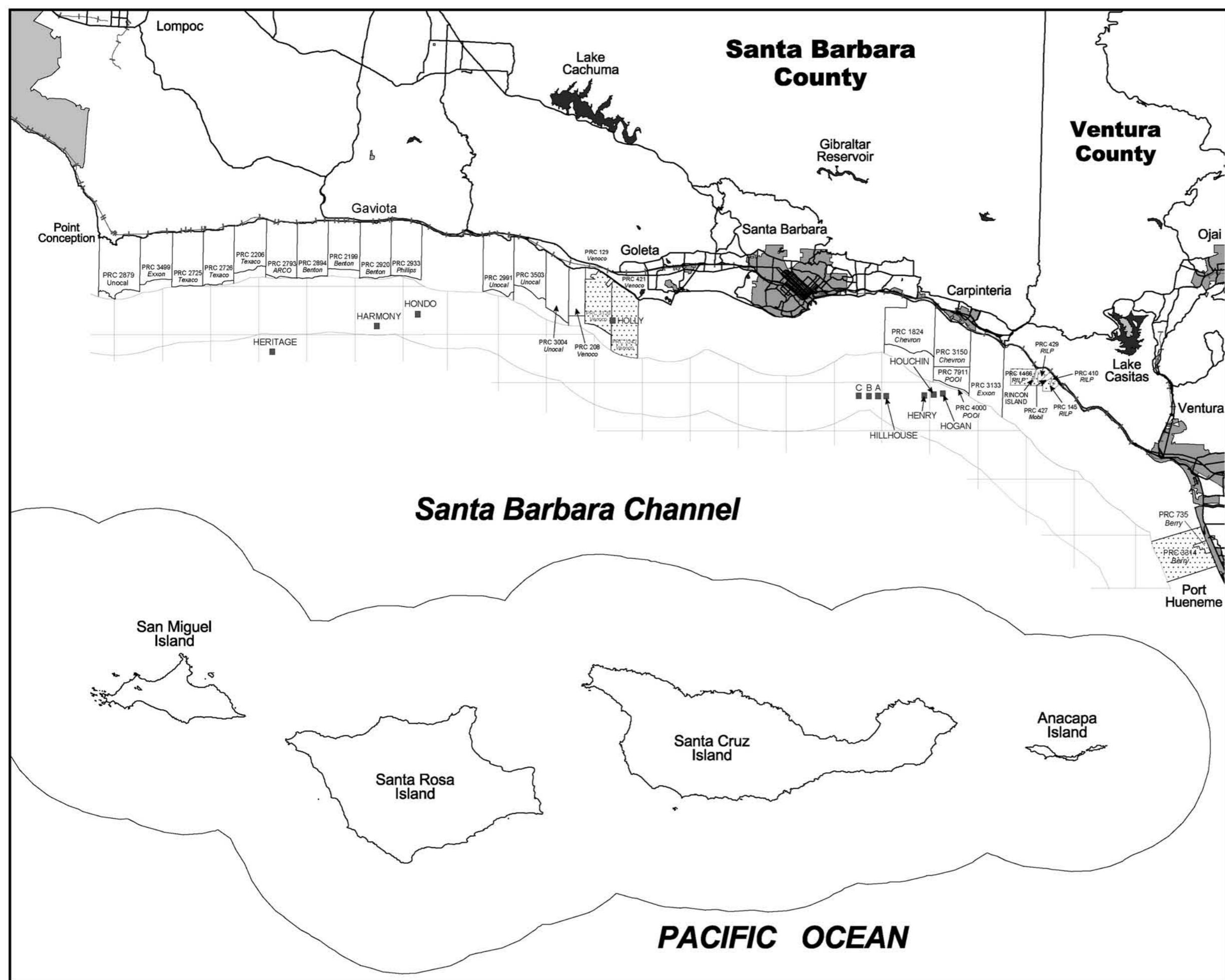
- The Carpinteria Field is located in the eastern Santa Barbara Basin about four miles south of Carpinteria and extends across the 3-mile limit separating the state and federal jurisdictions. The field covers portions of state leases PRC-3150 and PRC-4000 and federal leases OCS-P0166 and OCS-P0240. All production is from reservoirs in the Repetto Formation and is free of sulfur and hydrogen sulfide.

The state leases were produced by the removed Platforms Hope and Heidi, which were both in lease PRC-3150. Platforms Heidi and Hope were removed in early 1996. The federal leases are being produced from Platforms Hogan and Houchin located in lease OCS-P0166 and by Platform Henry located in lease OCS-P0240. Oil and gas produced from these platforms is transported to the La Conchita Facility via pipelines from Platform Hogan with a landfall in Ventura County in the La Conchita area.

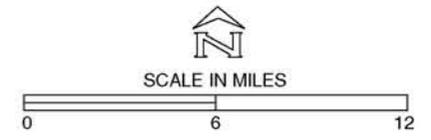
The Carpinteria Field is a mature, fully developed oil field in an advanced stage of depletion (MMS 2000).

- The South Ellwood Field is located in state waters near Goleta and includes lease PRC-208, PRC-3120, PRC-3243, PRC-308, and PRC-309. Projected production is from the Rincon and Monterey formation.

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 - EXISTING CINMS BOUNDARY
 - STATE OIL AND GAS LEASES
 - OIL PLATFORMS



**CINMS EIS STUDY AREA
STATE
OIL AND GAS LEASES**

Tetra Tech, Inc.
4213 State Street, Suite 100
Santa Barbara, CA 93110-2847

TC#	DATE	DRAWN BY	FILENAME	FIGURE NO.
10871-01	8/30/05	RANDALL	GRAPHIC:\CHANNEL ISLAND\3.4-2O&Gleasenew.ai	3.5-2

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The South Ellwood Field is produced from Platform Holly, which is located in 211 feet of water on lease PRC-3242 approximately 2 miles from shore in California state waters. Platform Holly was installed in 1965 and production began in 1966.

In addition to the platform, a seep containment tent was installed in 1983 to collect gas from natural seeps and the gas is sent to the Ellwood Oil & Gas Processing Facility by pipeline. The South Ellwood Field is apparently in a mature level of development. The South Ellwood Field, Platform Holly and the associated infrastructure were sold to a new operator (Venoco) in August 1997 (MMS 2000).

Future Production

The MMS projected offshore oil and gas production from 1995 to the end of 2015 is shown in Table 3.5-2. OCS oil and gas production is projected to decline in the Study Area by the year 2015 (MMS 2000).

**Table 3.5-2
Oil and Gas Production and Projections on the OCS**

Year	Oil (MMSTB)	Gas (BCF)
1995	73.99	57.69
2000	48.65	83.15
2015	4.38	35.00

Notes: BCF - billion cubic feet
MMSTB - million stock tank barrels
OCS – Outer Continental Shelf

Source: MMS 2000.

The MMS (2000) notes that several platforms would likely be decommissioned within the next 25 years because they are nearing the end of their economic production.

Undeveloped Leases

The existing Congressional moratoria and Presidential leasing deferrals do not restrict development of federally leased areas. Thirty-six federal leases remain in a “non-producing” status. These 36 tracts were leased between 1968 and 1984 and are in the Santa Barbara Channel or the Santa Maria Basin. This means there are several undeveloped leases not producing natural gas and/or oil, although some of these leases have been explored.

The MMS may grant lease suspensions or extensions upon lessees’ requests or directed suspension by the MMS Regional Director. When MMS receives a request for suspension, its options are to either approve or deny the request based upon the criteria in the MMS regulations. For a comprehensive review and summary of this issue, see California Coastal Commission (1999), *California Offshore Oil and Gas Leasing and Development Status Report*.

Table 3.5-3 depicts the federal leases that may be developable from existing or new platforms. If a federal lease does not have an existing platform nearby, there may be a need for a new offshore oil rig or platform to develop the lease.

**Table 3.5-3
Federal Leases Developable from Existing or New Platforms**

Unit Name	36 Undeveloped Federal Leases	Owner	Closest Existing Platform
Cavern Point	210, 527	Venoco	Gail and Grace
Gato Canyon	460, 464	Samedan	N/A
Sword	319, 320, 322, 323A	Conoco	Hermosa
Rocky Point	452, 453	Arguello Inc.	Harvest, Hermosa, and Hidalgo
Bonito	443, 445, 446, 449, 499, 500	Nuevo	N/A
Santa Maria	425, 430, 431, 433, 434	AERA	N/A
Purisma Point	426, 427, 432, 435	AERA	N/A
Point Sal	415, 416, 421, 422	AERA	N/A
Lion Rock	396, 397, 402, 403, 408, 414	AERA	N/A
(Non-Utilized)	409	AERA	N/A

Sources: California Coastal Commission 1999; Mayerson 2000.

3.5.1.3 Liquefied Natural Gas

There is a growing demand for natural gas in the United States, including California. The North American supply of natural gas is maturing, which means the United States will have to rely more on imported supplies. Natural gas is often imported in the form of liquefied natural gas, which is much more compact than the gaseous form, and therefore much easier to transport. In fact, one carrier load of liquefied natural gas is equal to 600 times the volume of natural gas shipped via pipeline (BHP Billiton 2003). In order to convert natural gas to its liquid form, it is cooled to minus 260 degrees Fahrenheit. During this cooling process the gas is purified, eliminating compounds like nitrogen, carbon dioxide, and hydrogen sulfides. The elimination of these compounds and other impurities enhances the clean-burning properties of the gas. Warming is required in order to convert liquefied natural gas back to its gaseous form.

Currently there are four liquefied natural gas receiving and regasification terminals in the United States, but no terminal is located on the West Coast (Marks 2003). Recently, several companies have proposed to locate liquefied natural gas import facilities in California (Marks 2003). Although there are no liquefied natural gas facilities within the CINMS, a couple of these facilities are proposed in adjacent locations within the Study Area.

In the 1970s, California's gas utilities were planning to build a liquefied natural gas import facility. They identified the Port of Los Angeles, Oxnard, and Point Conception as possible sites, all of which were outside the CINMS (Marks 2003). However, the three agencies involved in site approval could not agree on a preferred site. To address the conflict, at least at the state level, the project proponents turned to the legislature, which enacted the Liquefied Natural Gas Terminal Siting Act of 1977. Under this act the California Public Utilities Commission, with input from the California Coastal Commission and California Energy Commission, could approve one site. The California Public Utilities Commission chose Point Conception because of its remote location, but the proponents cancelled the project when liquefied natural gas became uneconomical. In 1987, the legislature repealed the Liquefied Natural Gas Terminal Siting Act, and no company has attempted to site a liquefied natural gas import facility on the

West Coast until recently. The current process for siting such facilities is unclear as a result of that repeal (Marks 2003).

BHP Billiton has proposed a liquefied natural gas facility named Cabrillo Port to be located 21.5 miles offshore of the City of Oxnard (BHP Billiton 2003), outside of the CINMS. This facility would consist of a floating storage and re-gasification unit (FSRU), which would be the receiving point for shipments of liquefied natural gas from ocean carriers. An FSRU is a floating vessel permanently moored offshore. Cabrillo Port would receive and store liquefied natural gas from ocean tankers. A process called re-gasification would then be used to convert the liquefied natural gas into its gaseous form, which would be transferred to the mainland via new pipelines that would connect to existing pipelines of the Southern California Gas Company at the Ormond Beach facility. Another type of liquefied natural gas facility involves the conversion of an offshore oil platform to accommodate liquefied natural gas storage and re-gasification. In March 2003, Crystal Energy signed a long-term lease agreement to use Platform Grace, located 11 miles offshore of Ventura County, as a liquefied natural gas facility (Crystal Energy 2003). This facility would receive liquefied natural gas from ocean carriers, store it, and convert it to a gaseous form before shipping it to land via existing pipeline corridors.

Potential impacts generated by a liquefied natural gas facility include impacts to air quality, the marine environment, visual resources, and traffic. Diesel-fired generators are the primary source of air emissions associated with liquefied natural gas facilities (Marks 2003). Diesel-fired generators are typically operated only during an emergency, therefore, under normal operating conditions, air emissions from the facility would be minimal. However, the U.S. Coast Guard (USCG) requires that vessels transporting liquefied natural gas generate their own electricity while they are in port. As a result, docked vessels transporting liquefied natural gas would generate air emissions from their diesel generators. Tugboats required to bring the vessels into port would also generate air emissions. However, in the case of an offshore liquefied natural gas facility, these impacts may not be generated, since vessels carrying liquefied natural gas would not be required to enter a port.

Liquefied natural gas facilities do not consume significant amounts of water or produce significant amounts of waste (Marks 2003). However, cold-water discharges are required in order to operate the heat-exchanger regasification systems. These cold-water discharges could generate significant impacts to marine life. If dredging and filling activities were required to accommodate large tankers carrying liquefied natural gas, impacts to the marine environment could also be significant. Visual impacts and traffic impacts may also be generated by a liquefied natural gas facility.

Liquefied natural gas is a hazardous material; the primary safety concerns are the potential consequences of a liquefied natural gas spill (Marks 2003). Liquefied natural gas hazards result from three of its properties:

- Cryogenic temperatures;
- Flammability characteristics; and
- Dispersion characteristics.

The extreme cold of liquefied natural gas can directly cause injury to humans and, on contact with metals, such as ship decks, can cause immediate cracking. Exposure to the vapor cloud can cause asphyxiation due to the absence of oxygen. An ignited liquefied natural gas vapor cloud can cause extensive damage to life and property as well (Marks 2003). Spilled liquefied natural gas would disperse faster on the ocean than on land and vaporizes more quickly on water (Marks 2003).

3.5.1.4 Transfer of Oil and/or Gas to Shore

Pipelines

Although oil and locally produced gas may be processed on a platform, in most cases they are processed at an onshore facility. In the Study Area, most offshore oil and locally produced gas are transferred to either the Unocal Santa Maria Refinery in San Luis Obispo County or to the Chevron oil and gas plant at Gaviota in Santa Barbara County. Transfer takes place through either the 180 miles of pipeline or by vessel. New liquefied natural gas storage and re-gasification units would require new pipelines to the mainland.

Lightering

Lightering is a method of delivering foreign crude oil to United States refineries and importing petroleum products (NRC 1998). Lightering, per the NMSP program-wide regulations at 15 CFR sec. 922.3, means “at-sea transfer of petroleum-based products, materials, or other matter from vessel to vessel.” Although no lightering currently occurs in or near the CINMS, the regulatory change under Alternative 1 (described in Chapter 2.0) would preclude this permanently; therefore, a discussion of this process is included in the following text.

Lightering becomes necessary when very large tankers, which are often used to move cargo from the Arabian Gulf and other distant sources of oil, are too wide and too deep to enter most United States ports. Transferring part or all of the cargo to smaller vessels for delivery to terminals is less expensive than moving all of the cargo the entire distance in a larger number of smaller vessels.

Lightering safety became a topic of national interest several years ago because of public concerns about oil spills in general (NRC 1998). The Coast Guard Authorization Act of 1996 requires that the USCG coordinate with the Marine Board of the NRC to conduct studies on the risks of oil spills from lightering off the United States coasts. Accordingly, an 11-member committee was assembled by the NRC, under the auspices of the Marine Board, to evaluate current lightering practices and trends, analyze the safety record, assess the regulatory and standards-setting framework, analyze accident prevention and risk reduction measures, and recommend technical and institutional improvements. The highlights of the one-year study and the committee's 16 recommendations are summarized below.

More than 25 percent of the 7.5 million barrels of crude oil imported into the United States each day is lightered (NRC 1998). Small amounts of refined products are also lightered. Approximately 95 percent of offshore lightering (i.e., between 12 and 200 NM off the United States coast), by volume, takes place in the Gulf of Mexico, according to government data. Additional offshore lightering takes place off Long Island, near the New Jersey and Virginia capes, off San Diego in California, and near the Bahamas. More than two-thirds of inshore lightering (i.e., within 12 NM of the coast), by volume, takes place on the East Coast, primarily in the Delaware Bay and River and Long Island Sound. The rest of the inshore lightering takes place on the West Coast, in San Francisco Bay. No known lightering takes place in the Santa Barbara Channel. The committee's estimates of the volume of oil involved in inshore lightering, combined with government data on offshore lightering, provide the most complete picture of United States lightering activity available to date. Although the projected increase of United States oil imports may lead to an increase in lightering, the committee expects that increases in the near term will be small and that current lightering patterns and volumes will remain fairly steady.

The vessel from which the cargo is removed is referred to as the ship to be lightered (STBL), and the receiving vessel is referred to as the service vessel. The STBLs and service vessels may either be owned

by an oil company or chartered on a long-term basis or for a specific voyage. The STBLs are typically large tankers. A number of United States companies are engaged solely in the lightering business and operate service vessels. Service vessels may be all-purpose tankers, tankers equipped specifically for lightering, integrated tug-barge units equipped specifically for lightering, or standard all-purpose tug-barge units.

The USCG data on lightering safety for 1984 to 1996 indicate that few spills occurred during lightering on United States coasts and, when a spill did occur, the average volume was only 26 barrels (1,095 gallons) (NRC 1998). Recurring causes of spills that appear to be directly related to lightering include valve failures, tank overflows, and hose ruptures. From 1993 to 1997, no spills were reported on the East or West coasts of the United States, and only seven spills (accounting for less than 0.003 percent of the total volume lightered) were reported in the Gulf of Mexico.

In an emergency, lightering may be needed within or adjacent to the CINMS. In accordance with the Oil Pollution Act of 1990 and 33 CFR Part 155, owners and operators of tank vessels are required to submit vessel response plans to the USCG for review and approval (U.S. Coast Guard 2003). These plans describe the preparedness arrangements made by the owners and operators for each Captain of the Port zone in which their tank vessel operates. These plans must include arrangements for a “qualified individual,” a spill management team, and contracted response resources. Contracted response resources include designations of emergency lightering companies, oil spill removal organizations, and salvage and firefighting companies (U.S. Coast Guard 2003).

3.5.1.5 Decommissioning of Offshore Oil and Gas Platforms

To date, seven relatively small offshore oil structures have been removed from state waters of the Santa Barbara Channel. The most recent project occurred in 1996 when Chevron removed Platforms Hope, Heidi, Hilda, and Hazel. These platforms were in water depths ranging from 100 to 140 feet. One hundred and thirty-four wells were plugged and abandoned on these platforms. In order to remove the rigs and bring them ashore for recycling and disposal, explosives and heavy machinery were used to tear the rigs from their foundations. The biomass that accumulated around these OCS oil and gas structures was destroyed during the platform removal (MMS 1997). Shell mounds remain on the bottom of the sea floor from these structures.

Comprehensive reviews of the ecological, economic, and regulatory requirements associated with decommissioning are found in McGinnis *et al.* (2001) and Carr *et al.* (2003). Impacts from the removal of oil and gas platforms depend primarily on the methods and extent to which the structure is removed. Removal may lead to issues such as:

- Destruction of the biomass that has accumulated on and around a structure;
- Destruction of benthic habitat and re-suspension of sediments;
- Noise impacts on living resources from explosives;
- Interference with filter feeding functions of marine organisms;
- Loss of food sources;
- Disruptions in populations and migratory patterns of fish, invertebrates and marine mammals; and

- Lowered photosynthesis and oxygen levels.

3.5.1.6 Regulatory Setting

A complete characterization of the regulatory setting for OCS oil and gas activities is found in California Resources Agency (1997), *California's Ocean Resources: An Agenda for the Future*.

Federal OCS Oil and Gas Exploration, Development, and Production

The MMS leases the federal OCS as well as conducts environmental review, permit processes, and ongoing monitoring for specific proposals to explore for, or produce oil and gas resources.

The NMFS protects marine species that could be affected by oil and gas development, including most marine mammals and anadromous fishes, and conducts a consultation with the applicant to determine if the development would threaten the continued existence of any protected species pursuant to the federal ESA.

The U.S. Army Corps of Engineers (USACE) requires permits to locate any surface structures in navigable waters.

The USCG implements provisions of the Oil Pollution Act of 1990 and requires adequate provisions to prevent and respond to oil spills that could occur from these facilities.

The U.S. Environmental Protection Agency (U.S. EPA) regulates operational discharge requirements under the Federal Water Pollution Control Act (usually concerning the discharge of drill muds and cuttings) and air quality impacts under the Clean Air Act.

The USFWS protects certain species that could be affected by offshore oil and gas operations, such as southern sea otters, and conducts consultation with applicants to determine if the development would threaten the continued existence of protected species pursuant to the federal ESA.

State OCS Oil and Gas Exploration, Development, and Production

The California Coastal Commission conducts federal consistency review of federal permits or any federal activity that may "affect" the coastal zone, and issues coastal development permits for activities in state tidelands and within land portions of the coastal zone, if local governments have not assumed the land permitting role under the California Coastal Act.

The Division of Oil and Gas (Department of Conservation) provides technical assistance to the California Coastal Commission for federal consistency review of projects on the OCS and has direct regulatory authority over specified oil and gas operations in state tidelands or onshore.

The CDFG provides technical assistance to the California Coastal Commission for federal consistency review of projects on the OCS and has direct jurisdiction for protecting and managing the state's wildlife resources that could be affected by proposed projects.

The CDFG's Oil Spill Prevention and Response (OSPR) provides technical assistance to the California Coastal Commission for federal consistency review of projects on the OCS, works with the USCG and other federal agencies to improve oil spill prevention and response in federal waters, and is responsible

for the review and approval of oil spill prevention and contingency plans for marine facilities in California.

The State Lands Commission provides technical assistance to the California Coastal Commission on federal consistency reviews for projects on the OCS, leases state tidelands, administers lease agreements for oil and gas production activities on land, and, in the case of a production facility located in federal waters, would issue a right-of-way lease for any portion of the pipeline which crosses state tidelands.

The State Water Resources Control Board and Regional Water Quality Control Boards provide technical assistance to the California Coastal Commission on federal consistency reviews for projects on the OCS that include discharges into the water column, and administer the NPDES and Waste Discharge Requirements for discharges from facilities in state tidelands.

The Air Pollution Control District and local Air Quality Management Districts administer approved state implementation plans for air emission discharges from onshore oil and gas facilities within their jurisdiction and from facilities on the OCS if delegated such authority by the U.S. EPA.

Local Agency OCS Oil and Gas Exploration, Development, and Production

County Land Use and Environmental Quality Reviews maintain regulatory authority over all onshore facilities used to support offshore oil and gas developments, including zoning, building permits, coastal development permits in areas with approved local coastal plans and all other applicable permits.

While state and federal governments have direct management jurisdiction over their respective offshore jurisdictions, local governments have jurisdiction over the permitting of onshore production facilities associated with OCS oil and gas activities (e.g., processing plants, pipelines, supply bases, and marine terminals). Development in unincorporated county areas is regulated by a county's comprehensive general plan, local coastal program, and zoning ordinances. Although all the elements of the general plan apply to development within the coastal zone, the Local Coastal Program (LCP) (which includes the coastal plan, coastal zoning ordinance, coastal zoning district maps, and other implementing actions) addresses specific policies that supercede other general plan policies. The LCP identifies acceptable development in the coastal zone and clarifies local policies and requirements that implement the requirements of the California Coastal Act. Local governments with a certified LCP have coastal development permit authority in the onshore coastal zone area. Locally issued coastal development permits for major energy facilities can be appealed to the California Coastal Commission. Local resource management or planning agencies typically act as the lead agency for projects involving offshore facilities, even when these projects also involve components on state tide and submerged lands (MMS 2000).

Because offshore oil production is often dependent on onshore support facilities, county governments are active participants in the planning and permitting process. Although most county agencies only have jurisdiction for the onshore components of the project, revisions to the OCS Lands Act and the Clean Air Act delegate regulatory review responsibilities to Air Pollution Control Districts. Under some circumstances, local residents are also formal participants in the planning process because county-wide initiatives have been passed that require the vote of citizens to approve onshore support facilities (MMS 2000).

Liquefied Natural Gas

Federal, state, and local government permits would be required in order to build a liquefied natural gas receiving and regasification terminal in California. Based on recent power plant licensing experience, the California Energy Commission staff believe approximately 100 permits could be required for a liquefied natural gas facility in California (Marks 2003).

Federal Undeveloped Leases

In 2003, the U.S. Department of the Interior decided not to appeal a court decision that supported the state's earlier lawsuit against the federal government, and the dispute over whether the California Coastal Commission has jurisdiction to review consistency certifications for requests for suspensions of exploration, development, and production or operation of 36 undeveloped offshore oil and gas leases within the Study Area (California Coastal Commission 2003a). The Ninth Circuit Court of Appeals upheld the authority of the state of California to review the re-issuance of federal offshore oil and gas leases for consistency with the state's coastal management plan (California Coastal Commission 2003b). The future of the federal undeveloped leases remains unknown.

State Undeveloped Leases

Development of oil and gas resources on existing state leases in the Study Area is subject to the regulatory authority of the State Lands Commission. Development of resources on state tide and submerged lands involving facilities at onshore locations is subject to local agency authority, including local agency administration of the California Environmental Quality Act (CEQA) requirements and other land use controls. As the California lead agency for administration of the CEQA process, the State Lands Commission is responsible for coordinating with other regulatory agencies and the public through the CEQA environmental review process. The California Coastal Commission is another key commission involved in the review of development on state tide and submerged lands (MMS 2000).

Transfer of Oil and/or Gas to Shore (Lightering)

Various controls have been imposed on lightering (and tanker operators in general) by international agreements and U.S. laws and regulations (NRC 1998). The USCG oversees lightering operations outside port areas through six general mechanisms: vessel design requirements, operational procedures, personnel qualifications, oil spill contingency planning and equipment requirements, vessel inspection, and monitoring. Three separate sets of regulations have been promulgated by the USCG regarding lightering activities. One set applies to lightering in inshore waters. For this purpose, inshore waters means all waters inside of 12 NM from the coast, including all internal waters (i.e., lakes, bays, sounds, and rivers). The second set of regulations applies to lightering in all offshore waters, except for designated lightering zones. Offshore, for this purpose, means between 12 and 200 NM off the coast. The third, and most comprehensive, set of regulations applies in designated lightering zones more than 60 NM off the coast. The USCG does not regulate lightering in foreign waters or outside the U.S. EEZ. Technically, lightering in offshore waters is subject to regulation by the USCG only when the cargo is bound for a United States port. As a practical matter, though, all oil lightered in United States waters is bound for the United States. Under the comprehensive national lightering regulations, four areas are designated lightering zones (offshore) in the Gulf of Mexico.

In general, lightering is performed with the local USCG captain of the port exercising regulatory authority (NRC 1998). The regulatory regime for lightering is widely regarded as adequate, with one notable exception. Vessels sometimes have to maneuver excessively or separate prematurely to comply with a

legal provision that requires certain vessels to remain within designated lightering zones in the Gulf of Mexico except in emergencies.

Industry guidelines for lightering have been established by at least two industry groups, and most individual companies have developed their own internal guidelines (NRC 1998). A set of comprehensive minimum standards for offshore lightering, now in its third edition, has been developed by the Oil Companies International Marine Forum (OCIMF), an international group of vessel owners and charters. The guidelines contain advice on lightering procedures and arrangements, as well as specifications for mooring, fenders, and cargo transfer hoses. In the United States, a supplement to the OCIMF guidelines was developed by the Industry Taskforce on Offshore Lightering, a cooperative organization that promotes industry self-policing and, in partnership with the USCG, continuous improvement in lightering in the Gulf of Mexico. The OCIMF guidelines are also widely used for U.S. inshore lightering (NRC 1998). General standards for inland shipping have been established by the American Waterways Operators, but no separate lightering standards have been established for inland trade despite its unique characteristics, such as the extensive use of barges and the frequent transport of specialized refined products.

Decommissioning of Offshore Oil and Gas Platforms

As of 2003, international, federal, and state law requires the complete removal of California OCS oil and gas structures (McGinnis 1998, 2003; McGinnis *et al.* 2001). A brief overview of the regulatory compliance requirements follows:

- *MMS* is responsible for implementing Federal law (30 CFR 250) which requires the plugging and abandonment of wells; full removal of well conductors and platform jackets to 15 feet below the mudline; decommissioning and full removal of platform decks; decommissioning and removal of pipelines and power cables as appropriate; and site clearance.
- *California Department of Conservation, Division of Oil, Gas and Geothermal Resources* is responsible for establishing the basic plugging requirements found in the California Code of Regulations Title 14 Division 2, Chapter 4, Section 1745.
- *State Lands Commission* is also responsible for establishing the basic plugging requirements found in the California Code of Regulations Title 2 Section 2128(q).

There are also lease and permit requirements that must be met during decommissioning of offshore oil and gas structures. The CDFG, the agency with oversight over the state's artificial reef program, has policy guidelines in place for artificial reefs with a preference for those structures that provide "good" habitat.

The framework of the National Fishing Enhancement Act of 1984 (33 U.S.C. 2101 *et seq.*), as amended, provided broad discretionary authority to states to develop rigs-to-reefs programs. This act created the National Artificial Reef Plan, which identifies OCS oil and gas structures as potential materials for development of offshore artificial reefs. Gulf of Mexico states have developed rigs-to-reefs programs in accordance with the act (Carr and McGinnis 2003; McGinnis *et al.* 2001; McGinnis 2003). However, it is important to note that the ecology and socioeconomic characteristics of Gulf states are very different from those off southern California (McGinnis 2003). Since the late 1990s, several California Senate bills have proposed the use of a rigs-to-reefs option for offshore oil rigs (McGinnis *et al.* 2001).

Provisions of MMS regulations provide the flexibility to allow MMS to consider and approve methods of rig decommissioning other than complete removal, as evidenced in the Gulf of Mexico. MMS may waive the removal requirement under special circumstances, including the following: (1) proper permits from the U.S. Army Corps of Engineers, (2) siting meets USCG requirements, and (3) the state accepts liability and holds the permit for the structure under its artificial reef program. MMS's stated policy towards the rigs-to-reefs alternative is as follows, "The MMS supports and encourages the reuse of obsolete offshore petroleum structures as artificial reefs in United States waters" (McGinnis *et al.* 2001).

3.5.2 Fiber Optic Telecommunication Cables

Fiber optic telecommunications cables are increasingly used to meet the growing demand for better productivity and quality in telephone, internet, and data transmissions. As a result, the number of project proposals and specific permit requests for laying cables in marine and coastal environments has been increasing at a tremendous rate (U.S. EPA 2003). Currently, no fiber optic telecommunication cables occur or have been proposed in the CINMS.

The NMSP has issued two special use permits to allow telecommunications companies to maintain fiber optic cables beneath the seafloor within the Olympic Coast National Marine Sanctuary (two cables permitted in November of 1999) and Stellwagen Bank National Marine Sanctuary (one cable permitted in June of 2000) (Department of Commerce 2003). An additional fiber optic cable is present within the Olympic Coast Sanctuary; however, this project was completed before the NMSP had examined the issue of fiber optic cable placement within sanctuaries (NOAA 2003).

There is evidence that the seafloor topography and rocky substrates offshore of California can preclude complete burial of fiber optic cables. No fiber optic cable projects that the California Coastal Commission has reviewed and approved have been 100 percent buriable (California Coastal Commission 2003c). Cable burial is important because it prevents potential entanglement of bottom-feeding whales, and prevents loss or damage to fishing gear.

3.5.2.1 Regulatory Setting

There currently are no specific regulations on installation of fiber optic cables in marine and coastal environments; however, each proposed project for installation of a fiber optic cable must undergo NEPA and/or CEQA review. In addition, each project must be approved by the various trust agencies of the land which the cable must pass. Finally, a Coastal Consistency Certification must be prepared and approved by the California Coastal Commission to ensure the project's consistency with an area's coastal plans and policies.

3.5.3 Vessel Traffic and Harbors

3.5.3.1 Vessel Traffic

The expansion of the global economy has resulted in a substantial increase in international vessel traffic through the Santa Barbara Channel. The CINMS is located about 70 miles northwest of the Port of Long Beach-Los Angeles. The Port of Long Beach-Los Angeles (Port) is the busiest container port in North America (Port of Long Beach 2003). The containerized trade at the port has grown 150 percent since 1990, and the Santa Barbara Channel is a main thoroughfare. An assessment of shipping patterns from January 1 through August 31, 2000 indicates that a majority of vessels that entered California ports were container vessels. Nearly 45 percent of the vessel calls identify a last port of call as Far East ports such as Japan, China and Korea, while 20 percent of the vessel calls originated from Pacific North American

ports in Canada and Mexico and 13 percent called at a South American port prior to arriving in California (California State Lands Commission 2000). Approximately 75 percent of the departing vessel traffic leaves northbound and 65 percent of arriving vessel traffic comes southbound, passing through the Study Area (this accounts for an average of 6,500 cargo vessels that travel through the Santa Barbara Channel each year).

According to the *Port of Long Beach Master Plan*, the Los Angeles Port Authority plans to expand capacity of the harbor, which will increase both the number and size of the vessels that use the Santa Barbara Channel (Port of Long Beach 2003). The Los Angeles Port Authority plans to increase capacity by 100 percent by the year 2020. The size of the commercial vessels that use the Santa Barbara Channel is expected to increase, with the 4,000 to 4,999 twenty-foot equivalent units (TEU) class being the predominant size class by 2020 (USACE 1984). The expected tonnage carried by commercial vessels is also expected to increase from 75 million tons in 1980 to 202 million tons by the year 2020 (Temple *et al.* 1988; USACE 1984).

Port Hueneme, the only deep-water international port in the Study Area, also generates vessel traffic. In 2000, 391 cargo vessels arrived or departed from Port Hueneme (Oxnard Harbor District 2002). Each year, approximately 158 supply vessel trips are made each year to regional oil and gas facilities (Oxnard Harbor District 2002). Total commercial vessel traffic is approximately 8,000 vessels per year, or an average of 21 vessels per day.

To help direct offshore vessel traffic in the Santa Barbara Channel, a Vessel Traffic Separation Scheme (VTSS) was designated in the Study Area to separate opposing flows of vessel traffic into lanes, including a zone between lanes where traffic is to be avoided. Vessels are not required to use any designated VTSS, but failure to use one would be a major factor for determining liability in the event of a collision.

The VTSS for the Santa Barbara Channel is depicted in Figure 3.5-3. CINMS is one of only two internationally accepted “areas to be avoided” (ATBAs) for oil tankers on the Eastern Pacific. As a result, oil tankers often voluntarily reroute to the outer Santa Barbara Channel. This reduces the number of oil tankers in the Santa Barbara Channel to insignificant levels, but these vessels still travel in the Study Area. In addition, many other hazardous materials are transported through the Channel.

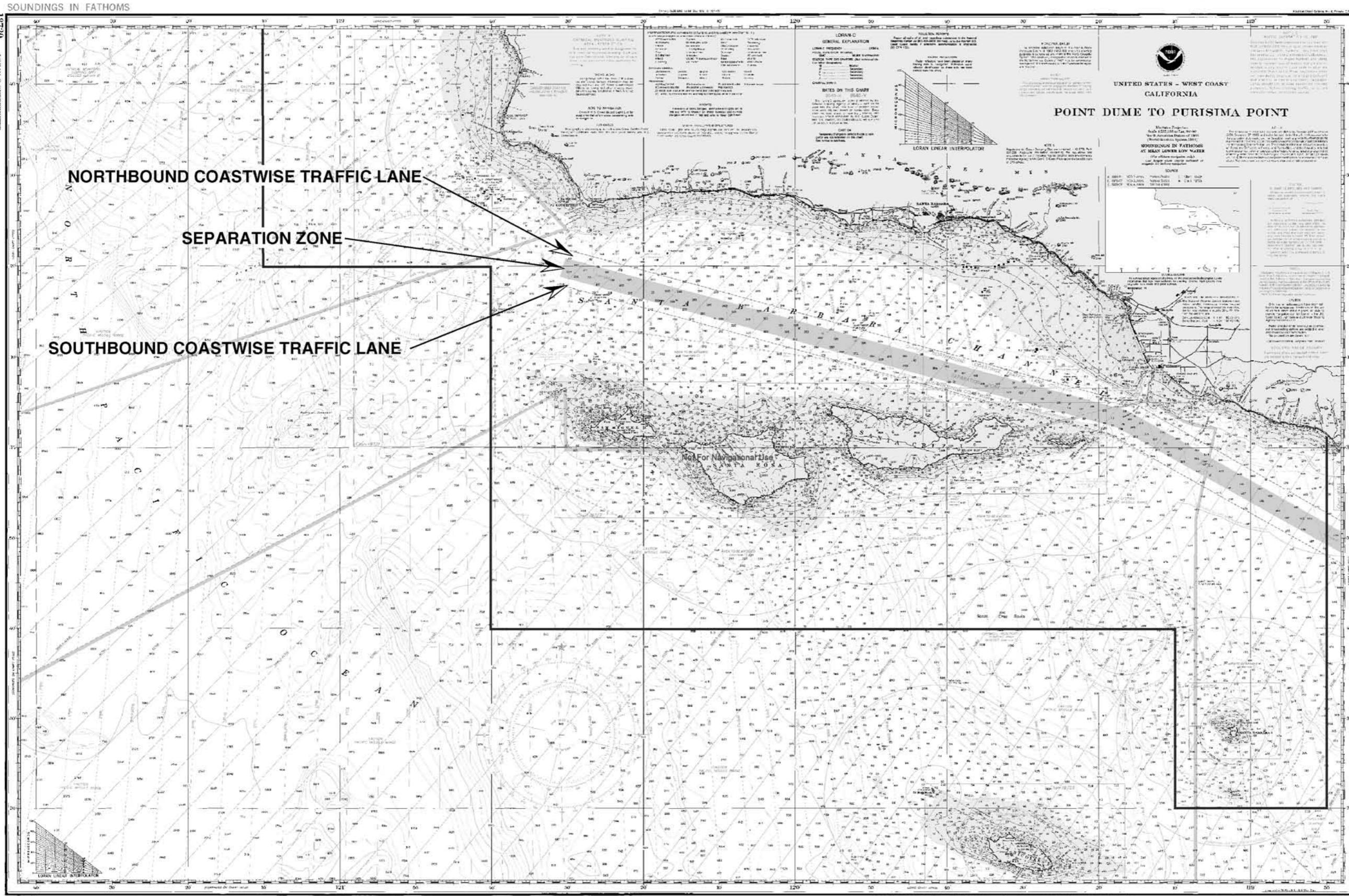
Data from the CDFG’s OSPR suggest routing vessel traffic 50 miles offshore significantly reduces the chance of oil impacting the coast. Although the USCG has no proposal for vessel routing off central California, the Western States Petroleum Association (WSPA) has volunteered to route all tankers carrying crude oil 50 miles offshore. A survey by the WSPA found almost 90 percent of tankers were 25 miles off the coast and nearly 50 percent were 50 miles or farther from the coast. This voluntary agreement does not apply to all carriers of hazardous materials.

Vessel Accidents

Potential accidents involving commercial vessels passing through the Study Area include collisions between vessels or between a vessel and an offshore oil/gas facility, groundings, and structural or operational difficulties taking place on a vessel with hazardous cargo (County of Santa Barbara Energy Division 1989). The northern extent of the Santa Barbara Channel VTSS ends at Point Conception, where vessels must depart from or merge into the VTSS as they change course with limited visibility around the point (County of Santa Barbara Energy Division 1989). The VTSS continues to the south, but it turns at the eastern end of the channel where visibility is again limited by offshore facilities and the Channel Islands (County of Santa Barbara Energy Division 1989). Three areas within the Santa Barbara Channel present the greatest risk of collisions between ships: the western end of the VTSS, the eastern

turn of the VTSS, and the intersection of the VTSS and the access lane to the Exxon Terminal (County of Santa Barbara Energy Division 1989). There are also three areas within the channel where groundings are considered most likely to occur: at Point Conception, landward of the Exxon Consolidated Marine Terminal, and eastern Anacapa Island (County of Santa Barbara Energy Division 1989). The coastline north of Point Conception has caused many groundings as well. According to the County of Santa Barbara Energy Division (1989), the risk of collisions is greater than the risk of groundings, which is considered quite low. The potential for collisions with oil facilities is greatest near Anacapa Island, where there is one platform within one mile and several platforms within 4 miles of the north lane of the VTSS. Statistically, smaller vessels have higher accident rates than the large supertankers.

The primary mechanism for damage to marine ecosystems with vessel accidents is spilled oil, which is carried on all vessels in varying amounts as fuel, cargo, or both (County of Santa Barbara Energy Division 1989). Non-tanker vessels, such as large cargo vessels, carry large volumes of bunker fuel used for propulsion. Bunker fuel is an extremely heavy oil, very similar to crude oil. Vessel fuel capacity ranges from 10,000 to 1.2 million gallons (NOAA 1998). The most common oil spills are those involving fewer than 50 barrels (County of Santa Barbara Energy Division 1989). Oil spill statistics for California and the United States confirm that the probability of a large oil spill is low in comparison to the amount of oil shipped. Although the probability of a large spill is low, the impact could be catastrophic due to the potential size of a spill (NOAA 1998). A corollary hazard to marine accidents is the potential for the spilled oil to ignite, creating thick smoke and soot, and hampering spill cleanup activities (County of Santa Barbara Energy Division 1989).



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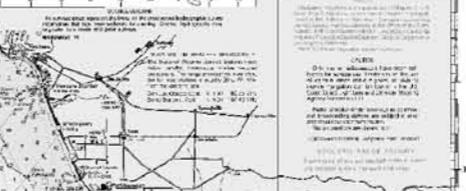
UNITED STATES - WEST COAST
CALIFORNIA

POINT DUME TO PURISIMA POINT

GENERAL EXPLANATION
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 SOUNDINGS IN FATHOMS
 AT MEAN LOWER LOW WATER



NOTES ON THIS CHART
 1. This chart is based on the latest available information.
 2. The soundings are in fathoms.
 3. The chart is based on the datum of Mean Lower Low Water.
 4. The chart is based on the datum of Mean Lower Low Water.
 5. The chart is based on the datum of Mean Lower Low Water.



CINMS EIS STUDY AREA
VESSEL TRAFFIC SEPARATION SCHEME

Tetra Tech, Inc.
 4213 State Street, Suite 100
 Santa Barbara, CA 93110-2847

TCR	DATE	DRAWN BY	FILENAME	FIGURE NO
10871-01	8/30/05	IGE	GRAPHIC:\CHANNEL ISLAND\3.4-VesselTraffic\	3.5-3

SOUNDINGS IN FATHOMS

(Point Dume to Purisima Point)

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Oil released during a vessel accident may include fuel oil used to power the vessel and/or cargo oil. These oils behave and affect the environment in different ways. Heavier petroleum products, crude oil, and bunker fuel last longer but are less toxic. Heavy crude oil tends to be very sticky, adhering to fur, feathers, and skin of mammals and birds, and harming the environment with its physical properties. In contrast, light petroleum products typically evaporate quickly but are more toxic. Volatile compounds in oil can burn eye, nose, and mouth membranes of various marine animals. Lighter hydrocarbons (benzene, propane, and toluene) enter the bloodstream and damage red blood cells, immune system, liver, kidneys, spleen, and the reproductive organs.

Oil, however, is not the only type of hazardous cargo transported through the study area. A recent example of a toxic, non-oil accident in the Study Area was the cargo vessel *Pacbaroness*, which collided with the car carrier *Atlantic Wing* off Point Conception in 1987. A relatively small amount of fuel entered the environment, but of greater concern was the cargo of 23,233 tons of powdered copper ore, which is toxic to marine organisms.

Initial surveys of the *Pacbaroness* shipwreck were completed in 1987 and 1988. The shipwreck was not revisited until 2002, when the site was visited as part of NOAA's exploration cruise known as *Sanctuary Quest: West Coast Expedition 2002*. During the 2002 survey, abundant marine life was found around the shipwreck, indicating the presence of a diverse marine life community (CINMS 2003). Bottom sediment was observed to have built up around the shipwreck, possibly encapsulating the spilled cargo. Sediment samples were collected around the shipwreck in order to determine the extent of the copper contamination and are being analyzed (CINMS 2003).

Vessel Strikes with Wildlife

A direct result of vessel traffic is the possibility of collision with marine mammals. Although NMFS maintains records of ship strikes, many such incidents go unreported, as evidenced by the number of stranded cetaceans, pinnipeds and sea otters with obvious propeller slashes or blunt force trauma suspected to have been caused by ship strikes. Even though reporting such incidents is required in U.S. waters, few ship strike reports are actually received.

West coast stranding records have revealed ship strikes involving the following species (Caretta *et al.* 2002; Laist *et al.* 2001; NMFS 2003a; Rugh *et al.* 1999; Scarff 1986):

- Sperm whales;
- Northern right whales;
- Gray whales;
- Blue whales;
- Fin whales;
- Minke whales;
- Humpback whales;
- California sea lions;

- Pacific harbor seals;
- Northern elephant seals;
- Southern sea otters;
- Leatherback sea turtles; and,
- Green sea turtles.

According to Caretta *et al* (2002), stranding records are a gross underestimate of injury and mortality. Not only do many ship strikes go unreported, but also many animals wash ashore in which ship strikes are suspected because of blunt force trauma, yet this cannot be proven. In addition, many species of whales are observed with apparent propeller slashes and other wounds consistent with ship strike, but these cannot be proven, either. In many cases, ship strikes are reported, but the species of marine mammal is not known. It is probable that ship strikes have occurred involving other species. Data from 58 well-documented ship strikes used in the first worldwide survey indicate significant impacts from ship strikes (Laist *et al.* 2001).

According to Laist *et al.* (2001), eleven species of whales have been documented worldwide as victims of ship strikes. Fin whales are hit most frequently, with right whales, humpback whales, sperm whales, and gray whales the other most common victims. Most ship strikes occur in coastal waters off the continental shelf, in areas with high concentrations of vessel traffic and whale populations. Although all types of vessels can hit whales, size and speed are the most important variables in assessing the potential for a fatal collision, according to Laist *et al.* (2001). Most lethal or severe ship strikes occurred with vessels over 80 meters in length. Of lethal or severe ship strikes, 89 percent were caused by ferries traveling at speeds over 12 knots, cargo ships over 14 knots, or cruise ships over 29 knots.

The majority of in-transit cargo vessels travel through the Santa Barbara Channel at speeds greater than 14 knots. During their migrations, many gray whales cross the shipping lanes, potentially needing to navigate around large commercial vessels each day. During the late summer and fall months, the Santa Rosa and San Miguel escarpment, just south of the shipping lanes, is heavily populated by blue and humpback whales. Finally, the region between the northern and southern Channel Islands is frequented by gray, blue, humpback, and fin whales. This concentration of whales and ships makes the potential for collisions between the two high throughout much of the Study Area.

NOAA Fisheries data indicate that ten suspected incidents of vessel collisions with whales were reported between January 1983 and May 1998 within or in close proximity to the Santa Barbara Channel (California Marine Mammal Stranding Network Database). While in most cases it is almost impossible to determine the actual location of a collision, these incidents are thought to have occurred within or in close proximity to the Santa Barbara Channel. Involved in these collisions were three species of whales including: gray (4), fin (3), blue (1) and unidentified (2). (There have been no records of ship strikes with northern right whales in the CINMS or in California.) The collisions resulted from various vessels types including: three Navy vessels, three freighters, and one whale-watching vessel. The remaining three incidents were stranded whales that bore propeller lacerations that were assumed to have been a consequence of collisions with unidentified vessels. Whales with definite propeller slashes have stranded along the mainland coast of Santa Barbara, Ventura, and Los Angeles counties, along with whales showing massive blunt force trauma. In addition, ships have arrived in the port of Los Angeles-Long Beach with dead rorquals draped over their bows. The bulbous protuberance common to modern vessels, which juts forward underwater from the bow, apparently traps some animals as they are struck. The

bulbous bow also drastically reduces the bow wake generated from such vessels, providing much less warning of a vessel's approach.

Most vessel strikes involving pinnipeds and sea otters appear to involve small, fast boats. Propeller slashes on such animals have been proportionately small, and collision reports have come from small vessels (NMFS 2003a). Also, such animals are often concentrated in shallow coastal waters where small craft abound.

There has been direct evidence of vessel strikes with sea turtles. Stranding records show evidence of vessel strikes with leatherback and green sea turtles primarily. (NMFS 2003(a)).

Vessel Air Emissions

Vessel traffic also plays a significant role in influencing air quality in the Study Area and throughout all of coastal Southern California. Emission inventory data are divided into two geographic regions in the Study Area, Santa Barbara County and the OCS. The Santa Barbara County emission inventory includes all onshore sources of air pollution in Santa Barbara County and in the state tidelands (within 3 miles of the shoreline) and is part of the South Coast Central Coast Air Basin. This basin also includes San Luis Obispo and Ventura counties. The OCS is its own air basin, and includes pollution from sources offshore of Santa Barbara County beyond the 3 mile state tideland boundary (Santa Barbara County Air Pollution Control District [SBCAPCD] 2003a).

The SBCAPCD is responsible for "implementing state and federal air pollution control laws in order to attain all ambient air quality standards and to minimize public exposure to airborne toxins and nuisance odors" (SBCAPCD 2003c). In order to accomplish this goal, the SBCAPCD issues clean air plans, adopts rules and issues permits to limit air pollution, inspects businesses to ensure compliance, monitors the County's air quality, reviews and implements new technologies to help clean the air, works with other government agencies to ensure their actions and decisions do not degrade air quality, responds to complaints and inquiries, provides information to the public, educates the public, and helps both businesses and individuals understand and comply with federal, state, and local air pollution laws (SBCAPCD 2003c).

Effective August 8, 2003, Santa Barbara County was reclassified by the U.S. EPA to attainment status for the federal one-hour ozone standard (SBCAPCD 2003b). The County had violated the federal one-hour ozone standard since 1970, when the SBCAPCD first began monitoring air quality. Since the Clean Air Act Amendments of 1977, the County has been classified in nonattainment of the federal one-hour ozone standard (SBCAPCD 2003b). In addition, the County was reclassified from a "moderate" ozone nonattainment area to a "serious" ozone nonattainment area in 1997, because although the air quality was improving, it was not improving quickly enough. Although Santa Barbara County was reclassified to attainment status for the federal one-hour ozone standard, it is still in violation of the state ozone standard, which is stricter than the federal standard. The SBCAPCD has released a clean air "Maintenance" Plan, which shows how the County will continue to be in attainment of the federal standard, and work towards attaining the state ozone standard (SBCAPCD 2003b).

The 1999 Annual Emission Inventory for the OCS estimates that 3,033 tons per year of reactive organic gases (ROG) and 10,612 tons per year of nitrogen oxides (NO_x) were emitted (ROG and NO_x are precursors of ozone). Of the 1999 ROG emissions, 12 percent (377 tons) was from stationary sources (oil and gas production), 22 percent (651 tons) was from mobile sources (marine offshore vessels), and 66 percent (2,004 tons) was from natural sources (gas and oil seeps) (SBCAPCD 2003). Of the 1999 NO_x emissions, 2 percent (255 tons) was from stationary sources (natural gas turbine engines involved in oil

and gas production) and 98 percent (10,356 tons) was from mobile sources (marine offshore vessels) (SBCAPCD 2003). More recent data for emissions from offshore marine vessels are also available. In 2000, marine vessels emitted 782 tons of ROG and 12,267 tons of NO_x (Petrini 2003). In 2001, marine vessels emitted 373 tons of ROG and 11,972 tons of NO_x (Petrini 2003). Although these data show a decrease in marine vessel emissions between 2000 and 2001, differences in data collection methodology likely account for these differences (Petrini 2003). The emissions data are summarized in Table 3.5-4.

Table 3.5-4
Summary of OCS Annual Emissions Generated by Marine Offshore Vessels

Year	ROG (tons/year)	NO_x (tons/year)
1999	651	10,356
2000	782	12,267
2001	373	11,972

Note: The decrease in emissions between 2000 and 2001 is likely due to differences in data collection methodology (Petrini 2003).

Sources: Petrini 2003; SBCAPCD 2003.

As evidenced by the annual emission inventory data, offshore marine vessels generate a significant amount of air pollution in the Study Area. Engine exhaust from vessels generates ROG and NO_x, but also carbon monoxide, sulfur, and particulate matter. Cruise ships, ferries, and naval vessels also routinely incinerate non-hazardous waste such as paper and plastics (NRC 1996). Few data are available regarding shipboard incinerator emissions. Analysis of emissions from incinerators on a 2,000-passenger ferry and a 3,500-passenger cruise ship indicate that such incinerators are sources of carbon monoxide, carbon dioxide, hydrogen chloride gas, NO_x, sulfur oxides, lead, and other metals (NRC 1996). The majority of heavy metal pollutants (cadmium, copper, lead, zinc, and iron) that enter the marine ecosystem come from airborne sources (Group of Experts on the Scientific Aspects of Marine Pollution 1990); some of these heavy metals may build up in the food chain, reaching toxic levels in predators.

MARPOL Annex VI on air emissions (which entered into force on May 19, 2005) addresses shipboard incineration, but the US has not ratified it. The Coast Guard has promulgated regulations on shipboard incineration that follow International Maritime Organization guidance, but are not as stringent as MARPOL Annex VI. California State Assembly Bill 471 was signed on June 4, 2003, to prohibit cruise ships from using onboard incinerators within 90 miles of the California coast and require the vessels to burn only California highway diesel within 25 miles of the California coast. The bill was approved by the Governor on September 23, 2004 and is now part of California Health and Safety code (Division 26, Part 2, Chapter 3.3, commencing with Section 39630).

Emissions from marine vessels may remain concentrated because air does not mix as well over water as over land (NRC 1996). This is because the heat flux over water is weak compared with that over land. The depth of mixing over water is relatively low, about 1,600 feet (500 meters) above low-latitude oceans. A mixing depth of about 300 feet (100 meters) was reported in studies designed to test offshore and coastal dispersion (NRC 1996). Shallow mixing depths can trap emission plumes and lead to high local concentrations of pollutants (NRC 1996).

Vessel Noise

Considerable low-frequency noise (sound below 1,000 hertz) is generated by human activities, and ships are the principal source of low-frequency anthropogenic noise in the Study Area. Some marine mammals vocalize and/or hear at lower frequencies, particularly mysticetes (whales) and pinnipeds (seals and sea

lions). Most odontocetes (beaked whales) vocalize at predominately higher frequencies; however, some species may vocalize or hear at lower frequencies as well. Shipping noise is transitory in intensity, slowly building as a vessel approaches, and fading after it passes. Considering this, it is extremely unlikely that a marine mammal could suffer injury or death from such noise, since it is improbable that a marine mammal, given adequate warning, would or could remain close enough to a transitory noise to cause damage. Sudden impulse power noises, such as those generated by geophysical airguns, underwater detonations, mid- and low-frequency sonar, and pile-driving activities, can cause injury or death if the sound is sufficiently loud.

Vessel noise can affect marine animals in subtle ways, however. All marine mammals rely on sound for communication and for detecting predators and prey. In the case of odontocetes, sound is also used for echolocation. Sounds that mask communications and make it difficult to hear predators and prey can adversely impact marine mammals. Several mysticetes emit low-frequency sounds that can be heard hundreds of miles away. Pervasive low-frequency sounds generated by shipping activities can mask such communications. At closer ranges, shipping noise can be sufficiently loud to drown out higher frequency signals. Also, the frequency spectrum of shipping noise is broader near the source, meaning higher frequency sounds can be emitted as well. Small craft generally have faster turning propellers and generate sounds in higher frequencies that can mask the echolocation sounds of odontocetes at closer ranges.

Another danger from shipping noise is habituation. When animals become habituated to the incessant drone of passing ships, they no longer perceive such sounds as threats. This may explain why ship strikes occur when they would appear avoidable. Moreover, the bulbous underwater bow section of modern ships was designed to minimize the bow wake of such vessels. The smaller the bow wake, the more swiftly and efficiently a vessel can move through the water. But the smaller the bow wake, the less noise such a vessel makes. Modern ships can stretch some 400 meters in length. If the bow wake is silenced, especially when whitecaps and other natural sounds mask the sound of the bow wake, the danger may not be perceived in time. The propeller is the loudest noise source on a ship, and it can be 400 meters from the bow.

Other effects include masking of important predator-prey cues, altering migration patterns or abandonment of important habitats, and negative effects on energy and physiology (Ketten 1998; Scheifele 2000). Fish and invertebrates may experience damage to eggs, reduced reproduction rates, and physiological or morphological damage from noise impacts (Lagardère 1982; Myerberg 1990; Hastings 1991).

Vessel Discharge

Although generally no type of pollutant discharge or dumping is permitted in CINMS waters, pollutant activities that occur legally farther offshore may still negatively impact the marine ecosystems of the CINMS. The International Convention for the Prevention of Pollution from Ships (MARPOL) was created in 1973 to regulate marine debris including oil, chemicals, harmful substances in package form, and sewage and garbage, that enter the marine environment from either accidental or operational causes. Routine and often legal oil discharge is a significant marine source of oil contamination in the ocean, as much as five times greater than catastrophic, accidental oil spills. The mandatory regulations for hazardous liquid are less stringent than oil. The MARPOL annex on sewage has not been ratified, so although there is no legal discharge of untreated sewage inside CINMS, there are no restrictions on sewage discharge outside the CINMS more than 3 NM from shore. While effects of dumping raw or under-treated sewage in smaller, closed ecosystems are better understood, the effects on large-scale ocean processes are unknown.

Disposal of food waste into CINMS waters beyond 3 NM from land is currently allowed as long as the waste is ground up to pieces smaller than 1 inch under the Act to Prevent Pollution from Ships; this act implements MARPOL.

Two California State Assembly Bills were recently signed on September 24, 2003, Assembly Bill 906 and Assembly Bill 121, to prohibit cruise ships from dumping graywater and hazardous wastes into state waters and prohibit cruise ships from discharging raw sewage or treated sewage, sewage sludge, oily bilge, and ballast water into state waters, respectively.

Ballast Water Exchange and Other Management

Ballast water from ships is a major source of the introduction of non-native species. Over 80 percent of the world's commodities are transported via ships, resulting in an annual transfer of an estimated 10 to 12 billion tons of ballast water across the globe (Global Ballast Water Programme 2003). The World Resources Institute estimates that every day, 3,000 aquatic species are transported around the globe in the ballast water of ships (World Resources Institute 2003). It is estimated that between 5,000 and 50,000 exotic species have been introduced into the United States with approximately 15 percent of these species becoming established (National Invasive Species Council 2001).

Nearly 4.6 million metric tons of ballast water were discharged into California ports between January 1 and August 31, 2000. Nearly 50 percent of those vessels discharging ballast in California originated from Pacific Rim ports (e.g., Japan, China, North and South Korea), while 30 percent came from Mexican ports (California State Lands Commission 2000).

Ballast water can contain four kinds of organisms: (1) plankton (2) nekton (3) benthos, and (4) fouling organisms. Many of these organisms are transported in their larval stages. Viruses and bacteria have also been detected in ballast water. All major and most minor phyla have been found in ballast water, averaging over 7,000 species relocating every day (Carlton 2001). Non-native species may become a new form of predator, competitor, disturber, parasite, or disease that can have devastating effects upon ecosystems. Changes in species interactions lead to disrupted nutrient cycles and altered energy flows that ripple with unpredictable results through the entire ecosystem. Section 3.5.5 describes in more detail issues associated with the introduction of exotic species in the CINMS.

The current technique for managing ballast water is an at-sea exchange of ballast water wherein coastal water taken at a port is replaced with less biologically productive open oceanic water. This process is not 100% effective, and can allow exotic species to survive until discharge in a foreign port or coastal area. It may also be dangerous to vessels because of loss of stability during reballasting, and should be attempted only during calm weather and oceanic conditions. Additional techniques that have been suggested include minimal or non-release of ballast water in foreign ports, and discharge to onshore reception and treatment facilities. The inadequacy of existing treatment facilities in most areas along the West coast is considered one of the main reasons this alternative is not being used by port authorities (Kimball 2001).

3.5.3.2 Harbors

Santa Barbara Harbor

Santa Barbara Harbor, built in 1926, is a 1,133-slip harbor used primarily by fishing, commercial, and recreational vessels. It is a popular destination for recreational boaters, fishermen, and tourists. The harbor offers a number of boating services including maintenance, hull cleaning, repairs, and towing (Santa Monica Bay Restoration Project [SMBRP] 2000).

Santa Barbara Harbor Patrol officers provide security and law enforcement services to the waterfront area. Using boats, patrol vehicles, and foot patrols, they monitor all areas several times each day. The Harbor Patrol enforces the California Boating Law. This law addresses the equipment and operation of boats. The Harbor Patrol also assists other agencies within the waterfront area with the enforcement of laws including camping, parking, drinking, and drug laws. Security of the harbor and marinas is maintained by regular foot, vehicle, and boat patrols over the entire area, which consists of 84 acres of water and 40 acres of land.

Vessels providing routine services to the offshore oil and gas industry typically do not use Santa Barbara harbor to load or unload personnel, supplies, or equipment, but they may refuel there. Vessels belonging to the Clean Seas Oil Spill Response Cooperative are anchored east of Stearns Wharf at the Santa Barbara Harbor (MMS 1999).

Ventura Harbor

Ventura Harbor is located approximately 65 miles northwest of Los Angeles. Since its opening in 1963, the harbor has increased in size so that it now encompasses 152 acres of land, 122 acres of water, and contains 1,375 slips. This small harbor is used primarily by small recreational and commercial vessels and provides several services and outdoor activities. Its proximity to the Channel Islands makes it an excellent point of origin for day or extended trips (SMBRP 2000). Although it is used primarily by recreational and commercial fishing vessels, Ventura Harbor does offer berths for some supply and work vessels that service offshore platforms (MMS 1999).

Channel Islands Harbor

Channel Islands Harbor is located in Oxnard, halfway between Ventura Harbor and Port Hueneme. With nine marinas and four yacht clubs, the harbor is home to more than 2,800 recreational and commercial vessels. Channel Islands Harbor is the closest harbor to the Channel Islands, making it a convenient location for day or extended trips. Public facilities and services include laundry rooms, restrooms and showers, picnic areas, marine supplies, and maintenance and repair shops (SMBRP 2000). Vessels associated with the offshore oil and gas industry typically do not use Channel Islands Harbor (MMS 1999).

Port Hueneme

Port Hueneme, the only deep water port between Los Angeles and San Francisco, is used by commercial ships to load and unload goods. It is also used by supply and crew vessels that service offshore platforms (MMS 1999).

Commodities shipped through the port include bananas and other fruit, automobiles, oil products, lumber, fish, livestock, wood pulp, liquid fertilizer, and other agricultural products. The Port of Hueneme is the import center for Mazda automobiles in Southern California. Mercedes Benz, BMW, Jaguar, Range Rover, and Mitsubishi Corporations also import stock through the port. Oil products, which are available for ship operation from the port, come in through barges at least quarterly (Ortiz 1999). The Port of Hueneme serves as the principal staging area for supplies, equipment, and crews for the oil platforms located in the Santa Barbara Channel. The port also handles a small amount of fuel oil for Southern California Edison Company. The newest commodity to be imported through the port is liquid fertilizer, which comes in bulk tankers (Ortiz 1999).

3.5.3.3 Regulatory Setting

Ballast Water Exchange and Other Management

There are a number of international, national and state regulations in place with respect to ballast water exchange.

The International Maritime Organization (IMO) was created by the United Nations in 1958 as a central clearinghouse for maritime issues. The IMO's Resolution A.868(20), adopted in 1997, and entitled *Guidelines for the Control and Management of Ships' Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens* suggests a number of policies to prevent the release of ballast water and discharge of exotic species in ports. These guidelines, however, are not legally binding.

The National Invasive Species Act of 1996, 16 U.S.C. 4701 *et seq.*, which was amended by the Non-Indigenous Aquatic Nuisance Prevention and Control Act (1999), supports a ballast water management program that aims to prevent the introduction and spread of exotic species into the EEZ by introducing preventive strategies and management techniques. Section 1101(c)(1) (16 U.S.C. 4711(c)(1)) of this act establishes voluntary guidelines to prevent exotic species introductions. Section 1101(c)(2)(D) (16 U.S.C. 4711 (c)(2)(D)) directs any vessel carrying ballast water into the EEZ of the United States to exchange ballast water outside the EEZ or to other waters where the exchange will not pose a threat of infestation to United States waters or apply sound alternative ballast water management methods.

The U.S. EPA Ballast Water Report (U.S. EPA 2002) summarizes the results of a study on aquatic nuisance species in ballast water discharges, and recommends actions to address the issue. The report suggests that the greatest barrier to effectively preventing the threats posed by exotic species is the lack of effective and affordable technologies for treating ballast water (U.S. EPA 2002).

In addition, the U.S. District Court for the Northern District of California on March 30, 2005 held that discharge of ballast water within three miles from shore is discharge of a pollutant and therefore requires a National Pollutant Discharge Elimination System (NPDES) permit. The court ordered EPA to repeal its regulation exempting ballast water from its NPDES permit program (Northwest Environmental Advocates et al v. EPA, 35 Env'tl. L. Rep. 20,075).

The State Lands Commission is collaborating with the State of Washington to develop an interstate approach for ballast water treatment systems for the shipping industry. The following California Resource Agency regulations address issues associated with ballast water management:

- Fish and Game Code; Section 6430-6433; Ballast Water Management Program.
- Harbors and Navigation Code; Section 132: Ballast Water.
- Public Resources Code; Section 30260-30265.5: Ballast water from tankers.
- Public Resources Code; Section 30707: Ballast water from tankers.
- Public Resources Code; Section 71200-71202: Ballast water.
- Public Resources Code; Section 71203-71207: Ballast water management practices.
- Public Resources Code; Section 71210-71213: Ballast water.

- Public Resources Code; Section 71215: Exotic species control fund.
- Public Resources Code; Section 71216: Ballast water reporting violations.

In addition, the West Coast Regional Applied Ballast Water Management Research and Demonstration Project is currently involved in research on ballast water issues. The following recent state laws regulate ballast water exchange:

- Assembly Bill 703 (1999) requires reporting and open ocean exchange for ships that discharge ballast water into California waters after operating outside of the EEZ. Starting January 1, 2000, the Ballast Water Management for Control of Nonindigenous Species Act of 1999 established a statewide, multi-agency program to prevent or reduce the introduction and spread of exotic aquatic species into the state waters under the direction of the State Lands Commission in consultation with other state and federal agencies. This program includes an inspection and monitoring program, biological surveys to determine the extent of exotic species introduction in state waters (conducted by the CDFG), and evaluation of alternatives for mid-ocean exchange, conducted by the State Water Resources Control Board. The law applies to all United States or foreign vessels that enter California waters after operating outside the U.S. EEZ. Moreover, vessels must either conduct a mid-ocean exchange of ballast water or retain all ballast water on board the vessel. The law also requires that the State Lands Commission develop and implement a ballast water inspection and monitoring program, and evaluate the effectiveness of the act. Under section 71205(a) of the act, ship agents and operators are responsible for submitting a ballast water reporting form for each voyage prior to the vessel leaving the first port of call in California;
- Assembly Bill 1334 (2001) bans the sale, possession and transport of the genus of *Caulerpa* throughout California;
- Senate Bill 1573 (2002) establishes the Interagency Aquatic Invasive Species Council to establish a plan to address the threats posed by aquatic invasive species in California by January 1, 2004; and
- Assembly Bill 1059 (2002) allows state officials to close Agua Hedionda Lagoon, or any other state waterway, to all recreational boating activities to control the spread of *Caulerpa taxifolia*.

The State Lands Commission (2000) reports that during the first three months of the new state program (noted above) compliance for reporting requirements was less than 60 percent statewide, and several large ship agents had compliance rates less than 50 percent. However, the State Lands Commission notes that compliance has improved since the early development and implementation of the state program.

Other Vessel Discharges

The regulatory setting for other vessel discharges is discussed above in Section 3.5.3.1.

3.5.4 Contaminant Sources

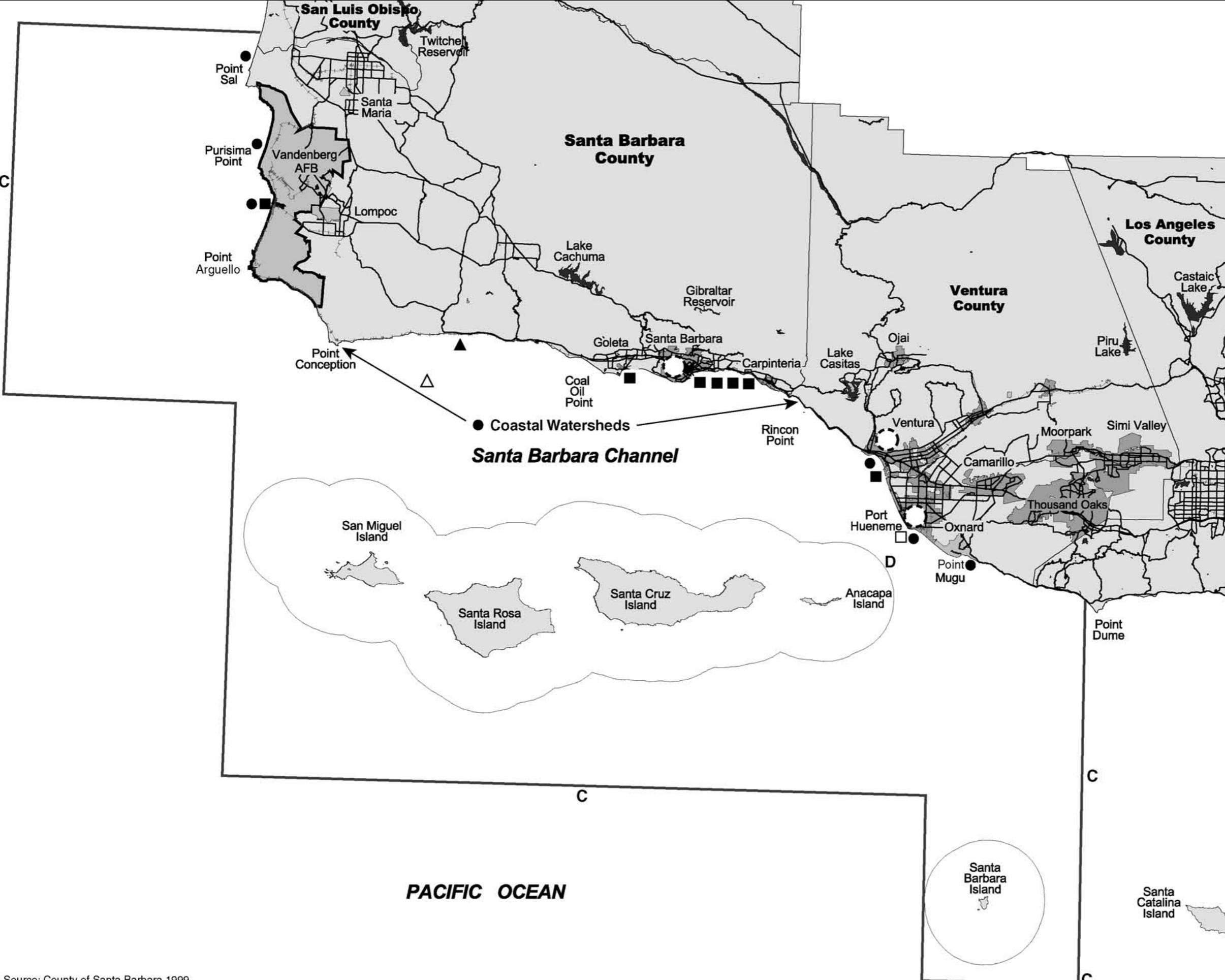
Water and sediment quality has been identified as one of the most important management issues affecting the general health and integrity of coastal marine ecosystems (California Coastal Conservancy 2001;

Ferren *et al.* 1997; Page 1999). During intense winter storms, millions of tons of material from coastal watersheds and urban areas are transported into the SCB, and can reach the northern Channel Islands. The “Plumes and Blooms” research program and partnership with the CINMS has shown that river discharge plumes distribute pollution throughout a large portion of the marine area; the Santa Clara and Ventura Rivers produce a plume that can enter the Santa Barbara Channel and extend as far as 37 miles westward. Plumes have been shown to cover areas from 38 to 580 square miles, although a 1,158 square mile plume was identified after an extreme storm event.

During winter storms, the four large rivers that discharge into the northern SCB (Santa Clara, Ventura, Santa Maria, and Santa Ynez Rivers) are capable of producing large discharge plumes that can affect the Santa Barbara Channel (Hickey 2000b). The discharge from a single major storm event can be much larger than the average annual discharge. During the upwelling conditions that follow major floods, the plume from the Santa Clara and Ventura Rivers can surround Anacapa Island (Hickey 2000b). Upwelling conditions also form a plume from the discharges of the Santa Maria and Santa Ynez Rivers that extends southward past Point Conception and enters that channel from the west (Hickey 2000b). The upwelling that follows major storms is very effective at moving fine sediments away from coastal river mouths and out toward the Channel Islands (Hickey 2000b). This material is derived from mainland river watersheds, which include agricultural lands and urban areas. Pollutants can be rapidly transferred from their point of origin to coastal marshes or the ocean (Hickey 2000b), at times reaching the CINMS.

This section focuses on water and sediment quality impacts associated with point and non-point source pollutants on the marine ecosystems of the Study Area, as well as pollution associated with natural oil seeps in the Santa Barbara Channel. Non-point source pollution, or polluted runoff, most often comes from a more ambiguous source, or a broader area, usually in the form of runoff from a variety of land uses such as agriculture, urban, and industrial operations. Point source pollution can be traced to a clearly discernible source, usually municipal or industrial facilities such as wastewater treatment plants, and oil refineries or power plants. The location of major contaminant inputs to the SCB is depicted in Figure 3.5-4.

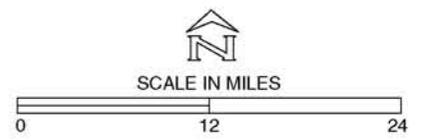
Two state Areas of Special Biological Significance (ASBSs)/State Water Quality Protection Areas (SWQPAs) are located within the boundaries of the CINMS. ASBS/SWQPA 17 is located in state waters surrounding San Miguel, Santa Rosa, and Santa Cruz Islands seaward to a distance of 1 NM, and ASBS/SWQPA 22 is located in state waters surrounding Santa Barbara and Anacapa Island seaward to a distance of 1 NM.



- LEGEND**
- ROADS
 - STUDY AREA BOUNDARY
 - RAILROAD
 - LAKES
 - LANDMARKS
 - PLACES
 - SANTA BARBARA CHANNEL ISLANDS
 - COUNTIES

- VAFB BOUNDARY
- POPULATION CENTER
- INDUSTRIAL EFFLUENTS
- OIL PLATFORM EFFLUENT
- POWER PLANTS
- SURFACE RUNOFF
- PUBLICLY OWNED TREATMENT WORKS

- DUMP SITES**
- C** CHEMICALS
 - D** DREDGED MATERIALS



**CINMS EIS STUDY AREA
POINT SOURCE CONTAMINANT INPUTS**

Tetra Tech, Inc.
4213 State Street, Suite 100
Santa Barbara, CA 93110-2847

TC#	DATE	DRAWN BY	FILENAME	FIGURE NO.
10871-01	8/30/05	IGE	GRAPHIC:\CHANNEL ISLANDS\3.4-4contam.ai	3.5-4

Source: County of Santa Barbara 1999.

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3.5.4.1 Natural Oil Seeps

Natural oil seeps are found offshore in the SCB from Point Conception to Huntington Beach. The largest concentration of seeps is in the Santa Barbara Channel area, adjacent to the CINMS (Wilkinson 1972). In the area of Coal Oil Point, seepage has been estimated to occur at a rate of 50 to 70 barrels of oil per day (Wilkinson 1972). These seeps produce continuous oil slicks on the surface of the water and even visible tar mounds on the bottom within kelp beds (Spies and Davis 1979). The natural seeps appear to cause no visible damage to nearby giant kelp beds, since extensive canopies regularly develop in these beds when oceanographic conditions are good for growth. In general, the oil released from seeps is moved by currents and wind to the shoreline, either on the mainland coast or the Channel Islands.

3.5.4.2 Point Source Discharges

Point sources of pollution to marine ecosystems include oil platforms, ocean dumping, municipal wastewater outfalls including storm water outfalls, and industrial outfalls including power plant cooling flows. Each of these point sources is discussed in more detail below.

Anderson *et al.* (1993) identified 178 discrete sources of contaminant and nutrient input to the SCB from Point Conception to the Mexican border. A total of 26 discrete input sources are located in the area from Point Conception to Point Dume (Table 3.5-5).

**Table 3.5-5
Summary of Inputs from Discrete Sources of Contaminants to the Study Area**

Location	Class	Flow (million m ³ /yr)	Number of Sources
Santa Barbara and Ventura Counties	Municipal waste (sewage)	52.9	8
	Power plant effluent	2,543	2
	Other industrial effluent	1.7	6
	Surface runoff	59.4	10

Source: Anderson *et al.* 1993.

Oil Platforms

Details on the number and type of oil and gas facilities within the Study Area are described in Section 3.5.1. The following text discusses potential point sources stemming from these facilities.

Effluent discharge is only permitted from oil and gas platforms located in federal waters; no discharges are permitted from facilities located in state waters. A total of 10 of the 16 platforms discharge produced water, while all platforms discharge deck drainage, treated sewage, well completion and workover fluids, and other effluents (MMS 2001). While all platforms have the potential to discharge drilling muds and cuttings, only Exxon's Platform Heritage (which is not within or adjacent to the CINMS) is conducting a drilling program and at present is using both water- and oil-based drilling muds for these extended reach wells.

A project conducted by the Southern California Coastal Water Research Project (SCCWRP) found that although offshore oil production in the region increased by a factor of six from 1935 to 1991, oil platforms operating in federal waters in 1990 were a relatively minor source of contaminants to the

coastal ocean. The mass emissions of drilling wastes were 9 percent of the mass emissions of suspended solids discharged from the four largest municipal wastewater treatment facilities in southern California. The mass emissions of contaminants from produced water from oil platforms were less than one percent of the combined emissions for the same constituents from the four largest municipal facilities. The total mass emissions from the offshore platforms were low because most drilling and sanitary wastes generated at offshore platforms in 1990 were sent to onshore facilities for processing.

There are, however, threats of offshore oil well blowouts, pipeline leaks, oil tanker spills, and leaks associated with decommissioning of platforms. The effects of large oil spills on giant kelp beds (*Macrocystis pyrifera*) have been documented twice along the western Pacific coast; once during 1957 when a small tanker, the *Tampico*, spilled a load of mineral oil in a cove along Baja California; the other during the 1969 offshore well blow-out and spill in the Santa Barbara Channel (Foster and Schiel 1985). North *et al.* (1964) studied the *Tampico* spill and noted that there was massive mortality of invertebrates, including sea urchins, in the cove. Damage to giant kelp was not obvious and within five months of the spill, vegetation in the cove was increasing and juvenile giant kelp began to develop. Presumably, the diesel oil had killed sea urchins that had been maintaining the bottom. Once the urchins were killed, giant kelp and other species of algae began to develop (North *et al.* 1964). Giant kelp plants that recruited following the loss of sea urchins produced canopy in the cove, approximately 18 months after the spill.

Crude oil from the 1969 Santa Barbara spill polluted a large portion of the mainland coast, and many of the Channel Islands (Foster *et al.* 1971). Assessment of the effects of the spill was complicated by record storms and rainfall that occurred at the same time as the spill. There was little damage to the giant kelp beds, even though considerable quantities of crude oil fouled the surface canopies (Foster *et al.* 1971). The partially weathered crude oil appeared to stay on the surface of the water and did not stick to the fronds of the giant kelp. In addition to the direct effects from oil spills on giant kelp, there are documented negative effects on kelp from substances used in oil spill cleanup operations. The surfactant-based oil dispersant Corexit 9554 has been shown to have acutely toxic effects on the early life stages of giant kelp (Singer *et al.* 1995).

Surfgrass and eelgrass beds can be particularly sensitive to oil pollution, but the impacts of oil on these marine plants is not well understood (Foster *et al.* 1988). Unlike slime-producing algae that can slough off oil, eelgrass has non-mucilaginous leaves to which oil quickly adheres (CDFG 2002).

Oil spills and chemical dispersants used in oil spill cleanup can have significant effects on wildlife as well. Animals exposed to oil may be affected by both internal and external impacts. Exposure of fish embryos to low levels of oil has been shown to cause physical deformities, damage to genetic material, and mortality (Carls 1999). Seabirds that have ingested oil have been found to suffer from petroleum toxicosis and damage to the liver, kidney, pancreas, lungs, and intestine, and external exposure to oil fouls waterproofing capabilities of birds (Newman *et al.* 2003). Long-term effects of oil exposure on seabirds have also been documented after rehabilitation of oiled seabirds, including behavioral abnormalities in California Brown Pelicans, and higher mortality rates in American Coots due to problems associated with inflammation, iron utilization, or metabolism (Newman *et al.* 2003). Sea otters, a species especially vulnerable to oil spills, may suffer impacts arising from oil ingestion (during grooming), inhalation and damage to pelage and ingestion of oil-contaminated prey (Bodkin *et al.* 2002; Ridoux *et al.* 2004). In a study of long-term effects of the 1989 *Exxon Valdez* oil spill in Prince Williams Sound, Bodkin *et al.* (2002) found that the area of the Sound most heavily impacted by the oil spill showed no evidence of sea otter population growth as of 2000, likely due to elevated mortality in and emigration away from this heavily impacted area. Bodkin *et al.* (2002) also found evidence that residual oil has persisted and been transferred through the nearshore food web for up to a decade after the oil spill. In general, oil impacts on marine mammals include: getting stuck in the oil, becoming stained with oil, decreasing foraging

performance, modification of prey availability, hydrocarbon absorption by prey species (lethal in high concentrations), and bioaccumulation of oil-specific trace elements (Ridoux *et al.* 2004). Affects of oil on several invertebrate species found within the Channel Islands has been observed, though little is known about these impacts and impacts on numerous other invertebrate species have not been studied. California mussels (*Mytilus californianus*) are adversely affected by oil spills (Chan 1973; Foster *et al.* 1971). Little is known about oil impacts on black abalone, but North *et al.* (1964) reported black abalone mortality following a spill in Baja California. Owl limpets (*Lottia gigantea*) are common in high and middle intertidal zones of exposed rocky shores from Washington south to Baja California. The limpets and their feeding territories are vulnerable to oiling, but oil impacts are unclear. For example, limpets of this species were not obviously affected by the 1971 San Francisco oil spill (Chan 1973). Oil impacts on invertebrates such as limpets and abalone may be exacerbated due to their low recruitment and slow growth rates, so recovery from any major disturbance likely would be lengthy.

Due to variability among petroleum products, environmental conditions, and affected taxa, once oil spills occur there is no simple solution to address them. While dispersants are known to have negative effects on marine organisms, in a recent study of comparative toxicity of oil, dispersant, and oil plus dispersant, Fuller *et al.* (2004) concluded that dispersant (Corexit 9500) toxicity in field applications would be negligible compared to oil toxicity. Fuller *et al.* (2004) also concluded that while all three scenarios (oil, dispersant, and oil plus dispersant) demonstrated that declining exposures were less toxic than continuous exposures, but only significantly so in the oil plus dispersant scenario. Following the 2001 *Jessica* oil spill in the Galapagos Islands Gelin *et al.* (2003) studied the effects of the spill on intertidal macroinvertebrate communities. While Gelin *et al.* (2003) did not have pre-spill baseline data for comparison, based on their analyses they concluded that there were no impacts on high-intertidal invertebrate communities at oiled sites 4 to 11 months after the spill. Based on these findings, Gelin *et al.* (2004) concluded that extensive shoreline cleanup operations were not warranted in response to this spill, and that the trampling, mechanical abrasion, and use of dispersants associated with such a cleanup would likely have generated more impact than the oil spill itself. There is no scientific agreement as to whether oil spill response and cleanup enhances or hinders ecosystem recovery following oil spill events. Oil spill prevention is the most effective means to avoid potential direct and indirect oil spill impacts.

Cold-water discharges would be a potential point source discharge from proposed liquefied natural gas storage and re-gasification units (see Section 3.5.1.3).

Marine Debris and Ocean Dumping

Another SCCWRP study found that manmade debris occurred on approximately 14 percent of the mainland shelf of the SCB (Moore and Allen 2000). Manmade debris was most common in the central (urbanized) region on the outer shelf, and in areas near municipal sanitary sewer system outlets. The most common type of manmade debris found in the central region and the outer shelf was fishing gear, while glass bottles and plastic were most common near the sewer outlets. Natural debris, primarily vegetation from onshore sources and marine vegetation from nearshore reefs, was more common close to shore in the inner shelf zone (Moore and Allen 2000). Because the manmade debris (fishing gear and plastic) was found farther from shore than natural debris, the primary source of manmade debris in the marine environment was believed to be fishing activity rather than storm water runoff (Moore and Allen 2000).

There are no active ocean disposal or dumping sites within the Study Area and discharge and disposal of most matter within the CINMS is specifically prohibited under existing regulations. Dredge spoils, low-level radioactive waste, and military munitions and/or explosives have historically been disposed of in the SCB. The majority of dredging and filling operations currently occur within port facilities (Resources

Agency of California 1997). There are inactive chemical dump sites located in the vicinity of Santa Lucia Bank and south of Santa Cruz Island. These sites were formerly used or designated for United States chemical munitions dumping. An additional area southeast of Santa Barbara Island is charted as a disused explosives dumping area. In addition, 3,100 containers of low-level radioactive waste were dumped off Port Hueneme at a depth of 4,570 meters (U.S. EPA 1983).

The following active ocean disposal sites are also close to the boundaries of the Study Area:

- Name: Los Angeles/Long Beach, California (LA-2)
Location: 33 degrees 37.10' North Latitude by 118 degrees 17.40' West Longitude (North American Datum from 1983), with a radius of 3,000 feet (910 meters).
Size: 0.77 square NM.
Depth: 380 to 1060 feet (110 to 320 meters).
Primary Use: Ocean dredged material disposal.
Period of Use: Continuing use, subject to submission of a revised Consistency Determination to the California Coastal Commission after 5 years of site management and monitoring.
Restrictions: Disposal shall be limited to dredged sediments that comply with the U.S. Environmental Protection Agency's Ocean Dumping Regulations.
- According to nautical charts, an active dredged material disposal site is located at the base of Hueneme canyon (NOAA 1992).

Ocean dumping in or near the Study Area may lead to transport of material to the CINMS. Impacts of ocean dumping are not well understood and are highly dependent on such factors as ocean currents and distribution of contaminants, chemical interactions of dumped materials in water and associated degradation time, and short-term and long-term biological impacts on living marine resources such as invertebrates, marine mammals, and fishes. Marine debris can also injure or kill marine mammals, seabirds, and sea turtles through ingestion and entanglement.

Municipal Wastewater Outfalls

Most water used for domestic and industrial purposes enters municipal treatment plants and eventually empties into the ocean. Section 402(p) of the Federal Water Pollution Control Act (FWPCA) also requires that storm water outfalls (e.g., surface runoff) be considered point sources. Surface runoff is composed of storm and dry weather flows that differ in contaminant concentrations, time, and duration. Surface runoff is approximately one-third the volume of municipal wastewater discharge.

Pursuant to the FWPCA, municipalities are required to provide secondary treatment (physical and biological treatment) of discharges to treat disease-causing bacteria, excess nutrients, and hazardous substances such as heavy metals and polychlorinated biphenyls (PCBs). However, Section 301(h) of the FWPCA provides for a waiver of the full secondary sewage treatment requirement if certain conditions are met demonstrating equivalent treatment.

Ocean discharge of treated sewage is common throughout the region. Sewage outfalls, with varying levels of sewage treatment, discharge into the Santa Barbara Channel (Table 3.5-6). Treatment facilities for point source pollution are categorized as primary (physical treatment), advanced primary (physical and some chemical treatment), secondary (physical and biological treatment), and tertiary (additional control measures beyond secondary treatment to remedy specific pollution problems). There are no

municipal wastewater outfalls within the CINMS. The wastewater treatment plant at Oxnard is the largest point source discharging into the Santa Barbara Channel.

Industrial Outfalls

Anderson *et al.* (1993) show that power plants discharge 10 times more volume than municipal wastewater treatment plants in the region. Other industrial inputs to the coastal waters in the region are small compared to other point sources. There are no industrial wastewater outfalls within the CINMS, but there are a few in the Study Area.

Untreated industrial effluent can include toxic organic chemicals (detergents, oil, industrial solvents) and toxic metals (mercury, lead), or elevated temperatures, which can affect marine organisms at several levels including metabolic impairment or damage at the cellular level, physiological or behavioral changes at the organism level, changes in mortality or biomass at the population level, and changes in species distribution or altered trophic interactions at the community level (Klee 1999). Discharges from industrial outfalls can also increase sediment input to the marine ecosystem that can destroy benthic biota or interfere with the filter feeding and respiratory functions of marine organisms. Industrial outfalls can also cause impingement of marine organisms on cooling water intake screens or entrainment through cooling water systems (U.S. EPA 2004).

The following power plants currently discharge into the Study Area:

- The Ocean Vista Power Generation Company (Ocean Vista) operates the Ocean Vista Generating Station (formerly the Mandalay Generating Station), a plant with a design capacity of 560 megawatts, in Oxnard, California, under a National Pollutant Discharge Elimination System (NPDES) Self-Monitoring Program. Ocean Vista may discharge up to 255.3 million gallons per day of wastes consisting of once-through cooling water from two steam electric generating units (four condenser halves), metal cleaning wastes, fireside and air preheater washes, and low volume wastes into the Pacific Ocean. The combined effluent is discharged through a concrete and rock-revetted structure (Discharge Serial No. 001) located at a point directly across the Mandalay Beach, west of the plant.

Ocean Vista monitors chemical constituents in their effluent. Ocean Vista also monitors receiving water column parameters twice a year at five shoreline stations and at twelve inshore stations. Seafloor sediments are monitored annually at five stations for general sediment quality and trace elements. Benthic invertebrate communities are monitored annually at five stations. Biological communities (monitored by trawl) are performed twice a year at four stations. Bioaccumulation in fish and invertebrates is not monitored.

- Southern California Edison operates the Ormond Beach Generating Station (Ormond), a 1,500 megawatt plant, in Oxnard, California, under a NPDES Self-Monitoring Program. Ormond may discharge up to 688.2 million gallons per day of wastes consisting of once-through cooling water from two steam electric generating units, metal cleaning wastes, and low volume wastes into the Pacific Ocean. The combined effluent is discharged through an ocean outfall (Discharge Serial No. 001) located approximately 1,790 feet offshore of Ormond Beach at a depth of 20 feet.

Ormond monitors chemical constituents and toxicity in its effluent. Receiving water column parameters are monitored twice a year at nine stations. Seafloor sediment are

monitored annually at six stations for general sediment quality and trace elements. Benthic invertebrate communities are monitored annually at the same six stations. Potential entrainment of fish and invertebrates on the cooling water intake screens are evaluated every two months. Trace elements are analyzed annually in bivalves sampled near the discharge conduit.

**Table 3.5-6
Municipal Wastewater Treatment Plants Discharging into the Study Area**

Municipal Wastewater Treatment Plants	Receiving Water	Level of Treatment	Volume Discharging (mgd)
City of Lompoc	Santa Ynez River	Secondary	3.72
Goleta	Santa Barbara Channel	Primary/Secondary	5.2
Santa Barbara	Santa Barbara Channel	Secondary	8.1
Montecito	Santa Barbara Channel	Secondary	1.1
Summerland	Santa Barbara Channel	Tertiary	0.17
Carpinteria	Santa Barbara Channel	Secondary	1.5
Oxnard	Santa Barbara Channel	Secondary	19.5

Note: mgd - million gallons per day

In Gaviota, Chevron U.S.A. Inc. (Chevron) Gaviota Oil/Gas operates a seawater desalination plant, a wastewater treatment plant for produced water from crude oil and natural gas production, and a wastewater disposal system operating under a NPDES Self-Monitoring Program. The outfall separates the oil and gas from the produced water, which is treated by means of induced-gas flotation and settling and is discharged to the Pacific Ocean through a 5,200-foot outfall and diffuser system. Chevron discharges combined desalination plant wastewater and treated oil and gas plant wastewater to the ocean through the Santa Barbara Channel. The U.S. EPA classifies this as a minor discharge.

3.5.4.3 Non-point Source Discharges

Non-point source pollution does not originate from individual, identifiable sources like industrial facilities, municipal sewage treatment plants, or offshore oil platforms. The U.S. EPA (2000a) identifies non-point source pollution as the nation's largest source of water quality problems, and runoff from urban areas as the largest source of water quality impairments.

Non-point source pollution results when rainfall or irrigation runs over the land or through the ground, picks up pollutants, and carries them to streams, rivers, wetlands, and coastal waters (U.S. EPA 2000a). It is widespread because it can occur whenever activities disturb the land or water. Agriculture, forestry, grazing, construction, physical changes to stream channels, septic systems, urban runoff, and habitat degradation are all potential sources of non-point source pollution (U.S. EPA 2000).

The most common non-point source pollutants are sediments and nutrients such as fertilizers. Other non-point source pollutants may include:

- Herbicides and insecticides from urban and agricultural runoff;

- Oil, grease, toxic chemicals, and heavy metals from urban runoff;
- Bacteria, viruses, and nutrients from livestock, pet wastes, and faulty septic systems;
- Accidental spills of fuels and other hazardous materials; and
- Air pollutants that settle out of the atmosphere onto the ocean.

The mainland watersheds that drain into the ocean in the Study Area all include urban and agricultural lands that yield non-point source pollutants. The two largest watersheds, those of the Santa Maria and Santa Clara Rivers, both encompass large agricultural areas. The Santa Clara River watershed has a large component of urban land as well. From Rincon to Goleta, 41 creeks enter the Santa Barbara Channel from the south side of the Santa Ynez Mountains. Many of these creeks flow through urban and agricultural areas along the coast and transfer non-point source pollutants directly into estuaries and coastal waters. Runoff from winter storms accelerates the delivery of non-point source pollutants to the marine environment. The Santa Clara and Ventura rivers are the largest contributors to non-point source pollution into the Santa Barbara Channel.

There are also a number of watersheds located on the four northern Channel Islands. A recent study by SCCWRP, under contract by the State Water Resources Control Board, surveyed water quality in State Water Quality Protection Areas around the four northern islands (SCCWRP 2003). The results of this study are summarized below.

San Miguel Island is unprotected from and directly exposed to all storms and ocean turbulence that comes its way. There are no roads and a few structures that are well beyond 100 meters of the coast. These structures—as well as a leach field located near the ranger station—are not likely to contribute to discharges into the CINMS. Although it is unlikely that the leach field could drain to the CINMS, this area was listed as a potential source of discharge. Twenty-nine outlets to the ocean (gullies or streams) were identified for this island.

Santa Rosa Island is the second largest of the Channel Islands and has approximately 46 miles of shoreline. It is a diverse island of grass-covered rolling hills, steep canyons, creeks, rocky intertidal areas and sandy beaches. Forty-one outlets (gullies or streams) were recorded for Santa Rosa Island. There are few potential anthropogenic sources upstream of these outlets, with the exception of road drainage and previous grazing impacts. The Central Coast Regional Water Quality Control Board has issued a cleanup and abatement order to the NPS requiring it to develop a road management plan, since the roads on this island do contribute to erosion and downstream deposition of sediment. No point sources were seen during the survey of this island. Santa Rosa Island has few structures and hosts mainly campers and hikers.

Santa Cruz Island is the largest of the Channel Islands and has approximately 77 miles of shoreline. The coastline of this island is diverse, consisting of sheer cliffs and bluffs, beaches, and grasslands. The Nature Conservancy owns and manages the western 75 percent of the island; the eastern 25 percent is owned and managed by the NPS. Sheep ranching was historically practiced on this island and areas where vegetation was depleted are still visible. Sixty-five outlets (gullies or streams) were recorded for this island. There are few potential anthropogenic sources upstream of these outlets, with the exception of previous grazing impacts. No point sources were observed during the survey for this island. Santa Cruz Island has few structures and hosts mainly campers and hikers. The inland Central Valley, somewhat distant from the islands' coast, has a few structures that house visiting scientists doing research on island flora and fauna.

Santa Barbara Island is surrounded by volcanic cliff walls and has only two facilities, a ranger station that is staffed by the NPS, and a landing facility, both of which are listed as non-point sources. Near the ranger station there is a leach field and three portable toilets. Although doubtful that the leach field contributes any significant discharge, it is listed as a potential non-point source discharge. The few visitors to the island are limited to some camping and hiking, but the primary activities take place offshore and include diving and fishing. There are no roads and only a few small foot trails.

Anacapa is the smallest of the Channel Islands and consists of three small islets. Ocean waves have eroded the perimeter of the island, creating steep sea cliffs and exposing the volcanic origins of air pockets, lava tubes, and sea caves. There are few structures on the island, which include a museum, visitor center, and a lighthouse. Activities on the island include camping and hiking. Only the boat landing facility for Anacapa Island was classified as a non-point source discharge.

Potential impacts to marine ecosystems from non-point source pollution include: lowered photosynthesis and oxygen levels, introduction of disease, disturbance to spawning and nursery areas, loss of food sources (trophic disruption) and habitats, chemical disturbances, destruction of benthic biota, resuspension of fine sediments, and interference with filter feeding and respiratory functions of marine organisms.

3.5.4.4 Regulatory Setting

Point Source Discharges

Numerous statutes address a variety of issues related to point source discharges to marine ecosystems. Federal statutes include the Federal Water Pollution Control Act (FWPCA) (33 U.S.C.1251 *et seq.*); the Rivers and Harbors Act of 1899 (33 U.S.C. 401 *et seq.*); titles I and II of the Marine Protection, Research, and Sanctuaries Act (commonly known as the Ocean Dumping Act) (33 U.S.C. 1401 *et seq.*); the Oil Pollution Act of 1990 (OPA) (33 U.S.C. 2701 *et seq.* and scattered); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9601 *et seq.*); and the Coastal Zone Management Act (16 U.S.C. 1451 *et seq.*).

In addition, state statutes that bear relevance to point source discharges include the Porter Cologne Water Quality Control Act (California Water Code Sections 13000–14958, *et seq.*); the California Coastal Act (California Public Resources Code Sections 30000–30900); and the Lempert-Keene-Seastrand Oil Spill Prevention and Response Act of 1990 (California Government Code Sections 8574.1–8670.5 and California Public Resources Code Sections 8750–8751).

Over the past 20 years, emphasis on point source pollution control has produced significant improvements in water quality. Dischargers are required to obtain permits specifying requirements to be met, including conditions for discharge, effluent standards, discharge improvement schedules, and self-monitoring activities.

Effluents

Federal. In 1972, the Congress enacted the FWPCA, which established the National Pollution Discharge Elimination System (NPDES), a permitting process to regulate point source discharges of pollutants to navigable waters of the United States. The U.S. EPA issues NPDES permits in federal waters and has delegated authority to the State Water Resources Control Board (SWRCB) to issue these permits in state waters. Permits are issued for discharges from sources such as offshore oil and gas platforms, municipal wastewater treatment plants, industrial outfalls, and storm water.

All NPDES permits for discharges affecting any land or water use or natural resource of the California coastal zone also require a determination by the California Coastal Commission that the activity is consistent with California's Coastal Management Program.

Section 402(p) of the FWPCA requires urban storm water outfall systems to be considered point sources and established a permit system that became effective in October 1992. The classification of urban stormwater as a point source can be somewhat confusing. Typical examples of point sources are discharges from discrete wastewater treatment facilities. Stormwater drainage usually emanates from many widely-dispersed sources and is often mistakenly thought of as a non-point source discharge. The 1987 CWA amendments require municipalities and industries to apply for an NPDES permit to discharge storm water into storm drains. The State Water Resources Control Board has adopted two general NPDES permits addressing storm water discharges associated with industrial and construction activities.

State. The State Water Resources Control Board has the primary responsibility to protect California's coastal and ocean water quality pursuant to the Porter-Cologne Water Quality Control Act. This act has provisions for enforcing water quality standards through issuance of Waste Discharge Requirements (WDRs). As stated previously, the State Water Resources Control Board has been delegated authority by the U.S. EPA to administer the NPDES program for discharges in state waters.

A Comprehensive Water Quality Control Plan for the region has been adopted by the Regional Water Quality Control Board (RWQCB). This plan identifies existing and potential beneficial uses and establishes water quality objectives for coastal waters. The RWQCB also enforces both state WDRs and NPDES permits issued to individual dischargers, subject to the approval of the State Water Resources Control Board and U.S. EPA. Dischargers are required to establish self-monitoring programs for their discharges and submit compliance reports to the RWQCBs.

Most NPDES permits and WDRs are combined into one permit. The State Water Resources Control Board has established regulations to implement these measures through water quality control plans that include the California Ocean Plan (Ocean Plan), Regional Water Quality Control Plans (Basin Plans), and Thermal Water Quality Control Plan (Thermal Plan). Both the Ocean and Basin plans identify beneficial uses within the area being addressed and lay out numerical and narrative objectives for waste discharges, as well as implementation procedures for achieving these objectives. The Ocean Plan applies to ocean waters, defined as the "territorial marine waters of the state as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons." If a discharge outside the territorial waters of the state could affect the quality of the waters of the state, the discharge may be regulated to ensure no violation of the Ocean Plan will occur in ocean waters (California Resources Agency 1997).

Enforcement of WDRs or NPDES permits by the RWQCB is done when monitoring or other sources indicate a violation of permit conditions. Cease and Desist Orders and Cleanup and Abatement Orders can be issued along with stiff financial penalties for noncompliance.

Fill and Dredged Materials

Authorization to dispose of dredged materials in the ocean, within enclosed coastal waters, or on land is provided through a variety of federal and state permit processes. Under authority of the Rivers and Harbors Act, Section 404 of the FWPCA, and the Ocean Dumping Act, the USACE develops, controls, maintains, and conserves the nation's navigable waters and wetlands. The USACE regulates development of any project involving fill, construction, or modification of waters of the United States.

For example, pursuant to Section 103 of the Ocean Dumping Act, the USACE is authorized to permit disposal of dredged material into the ocean if the USACE determines that "the dumping will not unreasonably degrade or endanger human health, welfare, or amenities, or the marine environment, ecological systems, or economic potentialities." However, the USACE is prohibited from issuing such a permit if the U.S. EPA finds that the proposal cannot meet its criteria established for disposal site selection pursuant to Section 102 of the Ocean Dumping Act. Federal permits for dredged material disposal cannot be issued, pursuant to Section 401 of the FWPCA, unless the State Water Resources Control Board issues or waives a certification that the proposed activity will not violate state water quality standards. In addition, the State Water Resources Control Board regulates discharges of dredged materials into state waters by issuing WDRs through its Porter-Cologne Water Quality Control Act authority. Finally, the California Coastal Commission has authority over disposal of dredged materials pursuant to the federal consistency provisions of the CZMA.

Marine Debris and Ocean Dumping

Reducing marine debris resulting from garbage disposal is one of the objectives of the 1973/1978 International Marine Pollution Convention (MARPOL Treaty) and the federal Marine Plastics Pollution Research and Control Act of 1987, which specifically targets plastic debris. Plastic debris is especially troublesome as marine species can become entangled in plastic products and frequently mistake the products for food.

The USCG is the federal agency charged with enforcing MARPOL-related regulations for trash, garbage, and plastics disposal at sea and requirements for sewage-holding tanks aboard vessels, although enforcing these regulations is logistically difficult. The RWQCBs have regulatory authority in marinas, but limited resources are available for enforcement.

Non-point Source Discharges

In the past few years, public awareness and government management efforts have turned to several complex and pressing issues regarding non-point source discharges, including the impacts of petrochemical and metals runoff from urban areas; nutrients, pesticides, and sediment runoff from agricultural and forestry operations; heavy metals leaching from inactive mines; erosion from modification of stream channels; and runoff from marinas.

Federal. There have been three developments in non-point source pollution response at the federal level:

- Section 208 of the FWPCA focuses on issue identification, initial planning measures, and voluntary programs that should be considered with regard to non-point source pollution.
- Section 319 was added to the FWPCA, providing a more aggressive approach to controlling or minimizing non-point source pollution by committing federal funds for state management plans, demonstration projects, and implementation plans.
- Section 6217 of the *Coastal Zone Act Reauthorization Amendments of 1990 (CZARA)* requires states with approved coastal management programs to develop Coastal Nonpoint Pollution Control Programs. The U.S. EPA and NOAA jointly administer this program at the federal level, while the California Coastal Commission, State Water Resources Control Board, and six coastal RWQCBs are required to develop and administer it at the state level.

State. The programs and policies of the State Water Resources Control Board for preventing non-point source pollution are included in its nonpoint source management plan prepared pursuant to Section 319 of the FWPCA and coastal nonpoint pollution control program pursuant to section 6217 of CZARA. Section 6217 requires the state to implement 56 enforceable management measures that have been identified by the U.S. EPA to address polluted runoff from all sources including: agriculture, forestry, urban areas, hydromodification, and abandoned mines. Although the emphasis of the program is currently voluntary, the relevant California statutes also provide enforcement mechanisms for these provisions.

As part of the nonpoint source management plan, the state has initiated a new program for Critical Coastal Areas as well. All watershed areas adjacent to ASBSs/SWQPAs are included in Critical Coastal Areas.

Water Quality Monitoring

Water quality monitoring is conducted in various locations along the California coast pursuant to permit requirements, voluntary programs, or efforts by government, the private sector, academic research institutions, industries, and various non-profit groups. Although multiple sources of water quality monitoring information exist, many portions of the coastline do not have regular sources and no comprehensive inventory currently exists to determine the full extent of these monitoring activities for the SCB. However, federal, state, and local agencies are striving to implement a regional monitoring program for the SCB.

The Southern California Bight Pilot Project, a regional monitoring program extending from Point Conception to the Mexican border, was implemented in 1994 to determine the ecological health of the region's waters. The pilot project involved cooperation by the four major ocean wastewater dischargers in the region, three coastal RWQCBs, the U.S. EPA, the CINMS, and an independent research facility, the SCCWRP. Since the pilot survey project in 1994, two additional surveys were conducted in 1998 and in 2003. Initial results from these surveys have been sufficiently promising such that regional monitoring has been proposed for other coastal regions.

The California Department of Health Services and many, but not all, of California's coastal counties conduct water quality testing and monitoring of coastal waters. Subsequent decisions to close beaches are based on non-compliance with Department regulations. County health departments are required to report beach closures to the State Water Resources Control Board where the data are entered into a centralized data collection system, and an annual beach closure report is prepared for the legislature.

The NMSP is active in water quality monitoring, water quality research and education, and emergency response planning for the CINMS. In addition to the Southern California Bight monitoring project, the NMSP is currently supporting researchers from the University of California, Santa Barbara to implement the Plumes and Blooms Project, which is an ongoing study of storm water runoff impacts on the Santa Barbara Channel. The NMSP is also implementing other various education and outreach water quality programs as discussed further in Section 3.5.10 below.

3.5.5 Introduction of Non-native and Genetically Modified Species

A native species is essentially a species that lives in its place of origin. In this context, origin is considered in terms of thousands of years. Native species evolve by adapting to their local habitats; all forms of life are a result of a continuing process of interaction between their inherited traits and characteristics of their environment. A native organism lives within its natural and historical range and zone of dispersal. Introduced species fall into two categories. A non-native (or exotic) species is a

species (including any of biological matter capable of propagation) that is not native to the ecosystem(s) in which it occurs (i.e., a species transported beyond its natural range to places it could not get to either by itself or through natural dispersal, such as by wind, tides, currents). A genetically modified species is any organism into which genetic matter from another species has been transferred in order that the host organism acquires the genetic traits of the transferred genes.

Exotic species can be introduced to the marine ecosystem via the hulls of commercial and recreational vessels and live-well tanks. As described earlier, ballast water can also convey adults, larvae, spores, and seeds of an introduced species but not necessarily the natural predators associated with the adult form. Benthic organisms may also inadvertently be taken in with sediments in water uptake. There are a number of other ways that exotic species are introduced to coastal marine ecosystems:

- Attachment to an intended introduced species, such as oysters for commercial harvesting;
- Intended introduction for commercial and sport fishery, mariculture, or biocontrol efforts;
- Release of unwanted organisms by aquarists or bait fishermen; and
- Natural spread from original point of introduction.

It is not just ballast water, but also vessel hulls, rudders, propellers, seawater piping systems, intake screens, ballast pumps, and sea chests that are capable of inadvertently transporting species. Introduced species can also be transported by dredging/drilling equipment, dry docks, buoys, seaplanes, canals, marine debris, and recreational equipment (Carlton 2001). Animals purposely transported for research, restoration, education, and aquarium activities also have potential for illegal release, whether intentional or accidental.

Although a definitive list of exotic species does not exist for the Santa Barbara Channel, a few of the most common exotic species off the California coast are *Sargassum* (brown alga), *Undaria pinnatifida* (Asian kelp), *Caulerpa taxifolia*, American lobster, European flat oyster, and Japanese clam. The CINP Kelp Forest Monitoring Project has not found dominant communities of exotic species. A 2005 report on non-native species monitoring in west coast national marine sanctuaries and National Estuarine Research Reserves provided information on non-native sessile invertebrates in the Channel Islands region (deRivera *et al.* 2005). DeRivera *et al.* (2005) deployed settling plates at six Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) buoys and two piers (Oxnard Vintage Marina and Ventura West Harbor) in the Channel Islands region in 2004. After 182 days they found 16 non-native invertebrate species (six bryozoan, nine urochordate, and one crustacean species). These organisms were introduced through vectors including shipping (hull-fouling), fisheries (accidental introduction via oysters), and ballast water. The first west coast introductions of these species occurred in locations such as San Diego Bay, La Jolla, Long Beach Harbor, Drakes Estero, Monterey Bay, San Francisco Bay and Tomales Bay in California, and Scammon's Lagoon in the Sea of Cortez, Mexico. DeRivera *et al.* 2005. Once exotic species have become established in international ports, recreational vessels traveling within California waters can transport the species. The species may also expand their range simply by drifting as planktonic larvae in the California Current and affect regional marine environments. For example, Morro Bay, with no international shipping, has over 25 exotic species.

Striped bass (*Roccus saxatilis*) were intentionally introduced to California in 1879. The California Department of Fish and Game manages a striped bass sport fishery under the Striped Bass Management Conservation Plan. This conservation plan is designed to maintain the striped bass population and sport fishery while allowing for recovery of several threatened and endangered fish species (e.g., Sacramento

River winter-run chinook salmon and delta smelt) given potential striped bass predation on them. (Leet et al. 2001)

Once sources of exotic species are established at locations such as ports and harbors, intraregional travel can expedite and permit spread of the species. Approximately 10 percent of established introduced species become invasive (National Invasive Species Council 2001). The term “invasive” applies to non-native species that cause or are likely to cause harm to the economy, the environment or to human health (Executive Order 13112, Appendix 1). The estimated economic costs of species invasions are \$137 billion per year (National Invasive Species Council 2001). With over 45,000 commercial cargo ships transporting 10 billion tons of ballast water around the globe every year, the rate of introductions is predicted to significantly increase (Carlton 2001).

Studies of exotic species in the San Francisco Bay and Delta estuary have described no less than 234 exotic species, with over 100 different species of aquatic invertebrates alone. Several of these species, including the European green crab (*Carcinus maenus*) may reach the Santa Barbara region in the near future, having recently been observed in Morro Bay (Grosholz 2003; Wasson *et al.* 2001). Moreover, studies of San Diego Bay have identified over 100 exotic species (U.S. Navy 2000). There has been a rapid increase of nonnative tunicates, for example, in southern California harbors and marinas and Asian kelp was recently discovered at Catalina Island (Silva *et al.* 2002).

Van Zyll De Jong *et al.* (2004) provide an example of long-term impacts from release of introduced species in Newfoundland and Labrador, Canada. While this study focused on species that are the subject of freshwater fisheries, the types of impacts described have broader relevance. Introductions began in these areas in the 1880s and have led to interspecific and intraspecific competition, predation, possible introduction of disease and parasites, genetic effects, and changes in community structure (Van Zyll De Jong *et al.* 2004).

Exotic species can have several types of impacts on native coastal marine species:

- Replacement of a functionally similar native species through competition;
- Reduction in abundance or elimination of an entire population of a native species, which can affect native species richness;
- Inhibition of normal growth or increased mortality of the host and associated species;
- Increased intra- or interspecies competition with native species;
- Creation or alteration of original substrate and habitat;
- Hybridization with native species;
- Other genetic effects;
- Transfer of new parasites and diseases; and
- Direct or indirect toxicity (e.g., toxic diatoms).

See also the information in section 3.5.3.3, entitled “Ballast Water Exchange and Other Management.”

Exotic species have negatively impacted over 45 percent of listed threatened or endangered species in the United States; the establishment of exotic species is second to habitat loss as the major threat to native species diversity (Government Accounting Office 2002; Kimball 2001; Wilcove *et al.* 1998).

Genetically modified species may cause environmental impacts similar to those of non-native species, in addition to impacts unique to transgenic species when released into the environment (Kapusinski and Hallerman 1990). In general, genetic modification of marine and aquatic organisms is used for the following purposes: to improve the quality and quantity of fish reared in aquaculture; as a detection tool for the prevention, control and management of diseases in aquaculture operations; to provide genetic markers used in population monitoring; for biofarming (e.g., freshwater Tilapia used to produce insulin); ornamentation; and for industrial applications (Aerni 2004). Kapuscinski and Hallerman (1990) suggested that genetically modified fish may exhibit three main categories of differences from their nongenetically modified counterparts: 1) physiological, 2) tolerance of physical factors (e.g., temperature, pH, or salinity), and 3) behavioral (e.g., seasonal migration, habitat selection, prey selection, territoriality, and reproduction); along with additional changes sought by geneticists such as increased resistance to certain diseases or to certain drugs. On a global scale approximately 35 fish species are the subject of transgenic research (Reichhardt 2000) and as of 2004, 14 fish species had been genetically modified for enhanced growth, though none had been approved for commercialization (Aerni 2004). In order for transgenic species to have a genetic impact on their nontransgenic counterparts their modified genes must spread through the wild population, which requires that the genetically modified individuals have a fitness advantage over their nongenetically modified counterparts in at least one of the following six components: juvenile viability, adult viability, age at sexual maturity, female fecundity, male fertility, or male mating advantage (Howard *et al.* 2004). According to Howard *et al.* (2004), when genetically modified individuals breed with nongenetically modified individuals within a population and the genetically modified individuals have a fitness advantage in one of the above components, the relevant modified gene will replace the natural gene in the population. However, when the genetically modified individuals have a fitness disadvantage in another component this has the potential to lead the affected population to extinction, a phenomenon the authors refer to as the “Trojan gene effect.” For example, this phenomenon may occur when genetically modified males have a mating advantage relative to nongenetically modified males, but their resulting offspring, which also carry the modified gene, have reduced viability relative to offspring without the modified gene (Kapusinski and Hallerman 1990; Howard *et al.* 2004).

Based on the numerous potential impacts of transgenic fish on natural ecosystems, and difficulty in assessing these potential impacts *a priori*, Kapuscinski and Hallerman (1990) recommended that special precautions be made to prevent use and release of transgenic fishes in proximity to environments with severely depleted or endangered species, environments with ongoing restoration projects, and for designated natural preserves. While proponents of genetically modified fish species suggest sterilization as a means by which to prevent many of the impacts associated with release of transgenic species, a zero risk of these impacts cannot be guaranteed since the current practice of developing all-female sterile offspring is less than 100% successful due to varying success in its application among different species and by personnel implementing these methods (Aerni 2004).

3.5.5.1 Regulatory Setting

Despite the threats posed by the introduction of exotic species to coastal economies and ecosystems, there is currently no federal monitoring program, ecosystem-based characterization, or biological inventory of exotic species associated with the CINMS.

Federal and state environmental policies have been adopted to address some of the threats posed by the introduction of exotic coastal marine species. The National Invasive Species Act of 1996 was passed to:

- Prevent unintentional introduction and dispersal of nonindigenous species into waters of the United States through ballast water management and other requirements;
- Coordinate federally conducted, funded, or authorized research, prevention, control, information dissemination and other activities regarding the zebra mussel and other aquatic nuisance species;
- Develop and carry out environmentally sound control methods to prevent, monitor, and control unintentional introductions of nonindigenous species from pathways other than ballast water exchange;
- To understand and minimize economic and ecological impacts; and
- establish a program of research and technology development and assistance to states in the management and removal of zebra mussels.

Executive Order 13112 (1999) also supports prevention of introduction of invasive exotic species. In October 2001, the National Invasive Species Council (established by Executive Order 13112) published *Meeting the Invasive Species Challenge*, which is a comprehensive management plan and report that outlines the necessary policy actions to prevent and control the spread of invasive exotic species.

The following California Department of Fish and Game regulations also address issues associated with the introduction of exotic species:

- Fish and Game Code; Sections 2116-2126; Illegal transportation of certain species.
- Fish and Game Code; Sections 6300-6306; Infected, diseased or parasitized fish, amphibian or aquatic plants.
- Fish and Game Code; Sections 6440-6460; Control of aquatic nuisance species.
- Fish and Game Code; Sections 8596-8598; Control of aquaria pet trade.

The CDFG's OSPR is responsible for conducting research to determine the location and extent of exotic species populations in coastal and estuarine waters of the state.

On October 10, 2003, California Governor Gray Davis signed California Senate Bill 245, which bans ocean farming in state waters off the coast of California of exotic and genetically modified fish. The law also bans ocean farming of salmonids unless it is conducted on behalf of the CDFG or it is for the purpose of recovery, restoration, or enhancement of California's native salmon and steelhead trout populations.

See also the information in section 3.5.3.3, entitled "Ballast Water Exchange and Other Management."

3.5.6 Fishing

3.5.6.1 Commercial Fishing

Commercial fishing (by nets, traps, and lines, diving, and other methods) occurs at various locations off the coast of Southern California, including the Channel Islands. The nearshore waters along the coast from Ventura to Santa Barbara and the waters around the Channel Islands contain giant kelp beds that support numerous species. The majority of fish are caught within these areas. Fishery seasons are established and regulated by the California Fish and Game Commission and regulated by the California Department of Fish and Game, except for groundfish and wetfish (anchovies, sardines and mackerels) and highly migratory species (tunas, dolphinfish, wahoo, marlin and sailfish). Groundfish, wetfish, and highly migratory species are federally managed by the Pacific Fishery Management Council and NOAA's National Marine Fisheries Service.

Live fish trapping (e.g., rockfish, sheephead, and other nearshore species) occurs primarily in the shallower waters near the coastlines of the Channel Islands. Hook and line fisheries catch a variety of species on hand lines, longlines, rod and reel, and trolled gear. Lobsters are trapped in coastal waters since they are typically most abundant in rocky areas with kelp in depths of 100 feet (30 meters) or less. The waters off the majority of the Channel Islands provide extensive rocky kelp habitat since they generally have an offshore shelf that extends gradually into deeper waters. Gill nets are not allowed within 3 NM of the mainland coast, or within 1 NM of the offshore islands in the CINMS. Commercial drift gill netting for pelagic shark and swordfish occurs in the open waters throughout portions of the CINMS. This fishery, however, is only a small portion of the total industry in southern California.

Key target species for commercial fishing in the CINMS and SCB include:

- Squid;
- Sea urchin;
- Spiny lobster;
- Prawn;
- Nearshore and offshore finfishes (e.g., rockfishes and California sheephead);
- Coastal pelagic species (e.g., anchovy, sardine, and mackerel);
- Flatfishes (e.g., California halibut, starry flounder, and sanddabs);
- Rock crab;
- Sea cucumber; and
- Tuna.

The commercial harvest of kelp and other marine vegetation near the coastline is an established industry in Southern California, and is described below under section 3.5.6.3. However, in June of 2005, ISP Alginates, the country's largest kelp harvesting company, announced it would be closing its southern California facility early in 2006 and relocating to Scotland (McMahon 2005). The rising cost of labor,

fuel, and raw materials as well as recent increases in the company's water and sewage expenses were the major reasons behind the decision to stop southern California operations (McMahon 2005). ISP Alginates was the only company harvesting giant kelp in the Sanctuary region (Ugoretz 2002).

In 1999 (a record year for market squid), 737 fishing operations received over \$36.7 million in revenue from fish and invertebrates caught in the CINMS. The 1996-1999 average revenue was \$20.3 million. Nineteen (19) percent of the operations (141 operations) accounted for 82 percent of the total revenue (Leeworthy and Wiley, 2003).

In 1999 (including kelp harvesting—about \$6 million annually- and including multiplier impacts defined in the glossary), commercial fisheries generated over \$141.6 million in income and supported 4,056 full and part-time jobs in the seven-county area from Monterey County south through San Diego County. The 1996-1999 average was \$82.9 million in income and 2,307 jobs. Supplies of commercial fishing products from the CINMS are a small portion of U.S. and world supply and therefore any reductions in CINMS catch would not be expected to have impacts on consumer prices and consumer's surplus. In addition, most commercial fisheries are either open access fisheries or over capitalized and therefore no producer's surplus or economic rents exist. Economic rents are most likely negative meaning reductions in fishing capacity would most likely yield positive benefits (Leeworthy and Wiley, 2003).

Brief descriptions of some of the more prominent fisheries in the Channel Islands follow below. More detailed descriptions are provided in *Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document* (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html.

Prawn Prawn fisheries in the Sanctuary area have historically included trawl and trap fishing for spot prawns (*Pandalus platyceros*) and trawl fishing for ridgeback prawn (*Sicyonia ingentis*). Traditionally, a number of trawl boats fished year round for both ridgeback and spot prawns, targeting ridgeback prawns during the closed season for spot prawns, and targeting spot prawns during the closed season for ridgeback prawns. Live individuals accounted for 95 percent of spot prawn landings (from trap and trawl vessels combined), and for the period from 1997 to 1999 accounted for 28 to 68 percent of ridgeback prawn landings (Leet et al. 2001).

The trawler fleet operates from Fort Bragg south to the United States-Mexico border. Most vessels operate out of Monterey, Morro Bay, Santa Barbara, and Ventura, although a number of Washington-based vessels participate in prawn fisheries during the fall and winter. The ridgeback trawl fishery began in 1965. Although the fishery for spot prawns started in the early 1930s when prawns were caught incidentally in Monterey area octopus traps, a trawl fishery did not begin in the Channel Islands area until 1974 (Leet et al. 2001). In 1985 a spot prawn trap fishery developed in the Southern California Bight and was concentrated around the Channel Islands.

Landings and revenue from these three fisheries have varied tremendously since their inception (Leet et al. 2001). Landings decreased dramatically from 1985 to 1991 (population declines were confirmed by California Department of Fish and Game surveys during that time), but have since increased to over 1.4 million pounds in 1999 (Leet et al. 2001, 2001; Thompson et al. 1993). In 1999, 30 commercial fishing operations received over \$725 thousand in revenue from prawn caught in the CINMS. The 1996-1999 average was about \$703 thousand (Leeworthy and Wiley, 2003). In 2002 the California Fish and Game Commission voted to close the spot prawn trawl fishery, regulations for which went into effect in 2003, while the ridgeback prawn trawl fishery remains open by permit.

Spiny Lobster (*Panulirus interruptus*) Since the late 1800s, there has been a commercial lobster fishery in southern California. Commercial lobster fishing occurs in shallow, rocky areas from Point Conception to the Mexican border and off the islands and banks of the Sanctuary area. Most of the fishery is in water less than 98 feet deep, although the fishery has expanded to include deeper habitats. A sport fishery (hand capture) is popular among scuba divers in the Channel Islands area.

The peaks and valleys that have characterized this fishery are not unexpected in a fishery strongly influenced by the weather, El Niño and La Niña events, and the export market. Seasonal landings in the 200,000 to 400,000 pound range rose following World War II and peaked in the 1949-1950 season, with a record 1.05 million pounds landed. A general decline followed for the next 25 years, reaching a low of 152,000 pounds in the 1974-1975 season. Landings remained between 400,000 and 500,000 pounds for nine consecutive seasons in the 1980s. Landings ranged from 600,000 to 957,000 pounds through much of the 1990s and subsequently decreased. About 90 percent of the legal lobsters taken in the commercial fishery weigh between 1.25 and 2.0 pounds, which produces the size of tail desired for the restaurant trade. Most of the harvest in recent years has been exported to Asian countries and France. However, depressed economies overseas have resulted in an effort to re-establish domestic markets. (Leet et al. 2001)

The commercial fishery for California spiny lobster is among the highest in commercial value. In 1999, 46 commercial fishing operations received over \$950 thousand in revenue from spiny lobsters caught in the CINMS. The 1996-1999 average was about \$922 thousand (Leeworthy and Wiley, 2003).

Rock Crab The rock crab fishery is made up of three species: yellow rock crab (*Cancer anthonyi*), brown rock crab (*Cancer antnarius*) and red rock crab (*Cancer productus*). Approximately 95 percent of the landings in this fishery come from southern California, although rock crabs inhabit the nearshore waters of the entire State (Leet et al. 2001).

In 1999, 71 commercial fishing operations received over \$313 thousand in revenue for all types of crabs caught in the CINMS. The 1996-1999 average was \$343.7 thousand (Leeworthy and Wiley, 2003).

Red Sea Urchin (*Strongylocentrotus franciscanus*) The red sea urchin commercial dive fishery is one of the most important California fisheries. This fishery is relatively new, having developed over the last 30 years, and caters mainly to the Japanese export market (Leet et al. 2001). The gonads of both male and female urchin are the object of the fishery and are referred to as “roe ”or “uni,” in Japanese. Gonad quality depends on size, color, texture, and firmness. Algal food supply and the stage of gonad development affect quality and price. The highest prices are garnered during the Japanese holidays around the new year.

The urchin fishery in southern California began in 1971 as part of a National Marine Fisheries Service program to develop fisheries for underutilized marine species (Leet et al. 2001). The fishery also was seen as a way to curb sea urchins’ destructive grazing on giant kelp. There have been two periods of rapid fishery expansion in California. The first culminated in 1981 when landings peaked at 25 million pounds in southern California. Contributing to this rapid escalation of the fishery was a group of fishermen and boats involved in the declining commercial abalone dive fishery. Sea urchin landings decreased following the El Niño of 1982-1983, when warm water weakened or killed kelp, the primary food source for sea urchins. Catches did not recover until 1985-1986, helped in part by the strengthening of the Japanese yen relative to the U.S. dollar, favoring California fishermen and exporters. Prices for urchin from the south are typically higher than for urchins from northern California due to the longer market presence and consistently higher gonad quality. The majority of sea urchin landings in southern California come from the northern Channel Islands off of Santa Barbara, where large and accessible

stocks once occurred (Leet et al. 2001). In the last few years the red urchin fishery has become fully exploited throughout its range in northern and southern California. The purple sea urchin, which occurs over the same geographical range, is also harvested in California, but only on a very limited basis.

In 1999, 331 commercial fishing operations received almost \$6 million in revenue from sea urchins caught in the CINMS. The 1996-1999 average was about \$5.3 million (Leeworthy and Wiley, 2003).

Sea Cucumber Most sea cucumber catch is taken in southern California waters, with commercial divers almost exclusively harvesting the warty sea cucumber (*Parastichopus parvimensis*) while trawlers primarily take the California sea cucumber (*P. californicus*). Divers take sea cucumbers as far south as offshore from San Diego, but most of the commercial catch is from the four northern Channel Islands in depths of 36-120 feet (Leet et al. 2001).

The warty and California sea cucumbers support an expanding commercial fishery that began in 1978 and peaked in 1998 at nearly 900,00 pounds (Leet et al. 2001). Most of the California and warty sea cucumber product is shipped overseas to Hong Kong, Taiwan, China, and Korea. Chinese markets within the United States also purchase a portion of California's sea cucumber catch. The majority are boiled, dried, and salted before export, while lesser quantities are marketed as a frozen, pickled, or live product. The processed sea cucumbers can sell wholesale for up to \$20 per pound. Studies of the biomedical properties of various sea cucumber chemical extracts, such as saponins, and chondroitin sulfates, are being conducted by western medical researchers investigating the efficacy of these substances for pharmaceutical products (Leet et al. 2001).

In 1999, 61 commercial fishing operations received \$269 thousand in revenue for sea cucumbers caught in the CINMS. The 1996-1999 average was about \$168 thousand (Leeworthy and Wiley, 2003).

Abalone Chinese Americans started the California abalone fishery in the 1850s, targeting green abalone (*Haliotis fulgen*) and black abalone (*H. cracherodii*) in the intertidal zone. Following the closure of shallow waters to commercial harvest in 1900, Japanese Americans began diving to collect abalone. The only commercially harvested species reported for the period 1916 to 1943 was red abalone (*H. refuscens*). In southern California commercial harvest of abalone was prohibited from 1913 to 1943, then reopened to increase wartime food supplies. Following World War II the fishery serially depleted one species of abalone after another, despite stable landings (at that time the fishery was managed as a single-species fishery though it targeted several species). The fishery alternated from targeting red, to pink (*H. corrugata*), to green, to white (*H. sorensensi*), and finally to black abalone. Since the 1960s a combination of factors including an increase in fishing pressure, an increase in the sea otter population, and an increase in gear efficiency led to a southward expansion from the original center of the fishery in Monterey.

The Department of Fish and Game determined that targeted abalone species had suffered stock collapse due to overfishing. In 1992 the black abalone fishery was closed after further significant stock decline associated with a bacterial disease known as "Withering Foot Syndrome" (Karpov et al. 2000). In 1997, California Senate Bill 463 closed all of California to commercial abalone harvest. However, between 1988 and 1997, over \$2.5 million of abalone was harvested from the CINMS (Leeworthy and Wiley, 2003).

Market Squid For over 100 years market squid (*Loligo opalescens*) has been harvested off the California coast from Monterey to San Pedro. The squid fishery has expanded into one of the largest fisheries in volume and economic value in California. Expanding global markets, especially in China and the

Mediterranean, coupled with a decline in squid product from other parts of the world, has fueled a rapid expansion of the California squid fishery (Hastings and MacWilliams 1999).

The majority of market squid harvest is centered in the northern Channel Islands region, mainly in the Sanctuary area. The peak of the fishery targets the squid mating and egg laying behavior and occurs during fall and winter in Southern California. On a good net set, tons of squid may be harvested. Squid are minimally processed, mainly in San Pedro, California, frozen and shipped around the world, predominately to markets in the Mediterranean and China (Hastings and MacWilliams 1999). Annual squid catches can be greatly influenced by El Niño events. In 1999 (a record year), 169 commercial fishing operations received over \$26.5 million in revenue from market squid caught in the CINMS. The 1996-1999 average revenue for the fishery was \$13 million (Leeworthy and Wiley, 2003).

Nearshore Finfishes The Nearshore Fisheries Management portion of the California Marine Life Management Act (MLMA; 1998) defined nearshore finfish species as rockfish, California sheephead, greenlings, cabezon and other species found primarily in rocky reef or kelp habitat in nearshore waters. In the subsequent analyses in this document, the category *rockfish* includes all species of rockfish and cabezon. Since the early 1990's greater emphasis has been placed on identifying individual fish species harvested from this group and avoiding market categories that combine multiple species.

The development of the live/premium fishery in the late 1980's resulted in increasing commercial catches of many species of rockfish occupying the nearshore environment in and around kelp beds. The principal goal of this nontraditional fishery is to deliver fish live to the consumer in as timely a manner as possible. This fishery has increased substantially since 1988, and it continues to supply communities with live and premium quality fish. The impetus of this fishery is the unprecedented and increasing high price paid for live fish.

In 1999, 128 commercial fishing operations received over \$553 thousand in revenue from all rockfish caught in the CINMS. The 1996-1999 average was about \$549 thousand. Wetfish (anchovies, sardines and mackerels) are a significant fishery in the CINMS and are caught by many of the same operations that fish for market squid. In 1999, 37 commercial fishing operations received over \$605 thousand in revenue from wetfish caught in the CINMS. The 1996-1999 average for wetfish was about \$301 thousand. (Leeworthy and Wiley 2003)

Other significant finfish fisheries included California sheephead (1999, 92 commercial fishing operations received \$153 thousand) and sculpin and bass (staghorn sculpin, yellowchin sculpin, rock bass, spotted sand bass, kelp bass, barred sand bass, white sea bass—1999, 43 commercial fishing operations received \$103 thousand). The 1996-1999 averages were \$235.9 thousand for California sheephead and \$60.3 thousand for sculpin and bass revenues. (Leeworthy and Wiley 2003)

Other relatively minor fisheries included swordfish (1999, \$21.5 thousand), shark (1999, \$41.6 thousand), roundfish (sablefish, louvar, lincod, kelp greenling and Pacific Whitefish—1999, \$37.3 thousand) and yellowtail (1999, \$14.8 thousand). (Leeworthy and Wiley 2003)

Flatfishes The flatfish fisheries of interest include California halibut, starry flounder, sanddabs and other flatfish. California halibut is caught by trawl and hook-and-line, and is an important fishery in the State. Both recreational and commercial anglers prize flatfish and they are targeted from boats, piers, and the shoreline. Major fluctuations in landings of some species seem to indicate inconsistent recruitment and availability. In 1999, 85 commercial fishing operations received \$323.6 thousand in revenue from flatfishes caught in the CINMS. The 1996-1999 average was almost \$184 thousand (Leeworthy and Wiley, 2003).

Tuna The tuna category includes several highly migratory species, including albacore, bluefin tuna, yellowfin tuna, and bonito. Trolling or jig vessels take the majority of albacore, with a small portion using live bait. In addition, the wetfish fleet may target some tuna species during the summer. In some year, they may catch significant amounts of albacore (Leet et al. 2001). Historically, commercial effort for albacore has fluctuated over the past 100 years, based primarily on market and oceanic conditions.

In 1999, 19 commercial fishing operations received \$53.7 thousand in revenue from tunas caught in the CINMS. The 1996-1999 average was \$205.9 thousand (Leeworthy and Wiley, 2003).

3.5.6.2 Recreational/Sport Fishing and Consumptive Diving

Recreational (sport) fishing involves hook-and-line fishing from piers and docks, jetties, breakwaters, beaches and banks, private or rental boats, and commercial passenger fishing vessels. Recreational fishing also includes activities such as spear and net fishing. Recreational fisheries in the CINMS access both nearshore and offshore areas, targeting both bottom fish and pelagic fish species. Consumptive recreational divers use both private and rental boats and commercial passenger fishing vessels.

The coastlines around the Channel Islands are popular sportfishing areas; although the majority of kelp beds are within 1 NM of shore, some fishing areas extend far from shore and include lingcod and rockfish grounds west of San Miguel Island; tuna, broadbill swordfish, marlin, and mako shark waters south of Santa Cruz Island; and kelp beds offshore and surrounding portions of all of the islands.

The sportfishing industry in California is composed of commercial passenger fishing vessels, private boats, and shore anglers. The commercial passenger fishing vessels take groups of anglers out on half-day, 3/4-day, full day, and multi-day trips. Types of fish landed on commercial passenger fishing vessels include kelp bass, mackerel, California sheephead, halfmoon, and whitefish. Sport fishing for white seabass is also very popular. The majority of half and 3/4-day trips fish within or near the kelp beds except in the summer when California barracuda (*Sphyraena argentea*) and Pacific bonito (*Sarda chiliensis*) are present. Offshore fishing focuses on more mobile species like yellowtail, tuna, and white seabass. The largest numbers of fish caught for recreational purposes are caught within 3 miles of shore. Barred surfperch, California halibut, jacksmelt, pacific mackerel, kelp bass, rockfish, white croaker are a few of the species that represent the largest numbers caught. Commercial passenger fishing vessel dive trips are often multi-day trips going to one or more of the offshore islands. These trips focus on certain species during various seasons, such as lobster during the open season.

A large number of sport divers (both free divers and SCUBA divers) spearfish for many of the same species caught by hook and line. Species commonly targeted by consumptive divers include many rockfish species and kelp bass, halibut, yellowtail, and white seabass, as well as lobster and scallops. Divers are generally limited to the shallowest waters of the CINMS between the shallow intertidal to depths around 130 feet.

Recreational fishing can have a greater impact on the ecosystem than commonly thought and can be equal to or greater than the impact of commercial fishing (Schroeder and Love 2002). Although some stocks are healthy and support viable recreational fisheries, six species of fish popular with recreational fishermen have been declared overfished by the Pacific Fishery Management Council in the Study Area: cowcod, bocaccio, yelloweye, canary rockfish, lingcod, and Pacific ocean perch. Slow growth and late maturity make these species especially susceptible to decline from fishing pressure (Love and Schroeder 2003).

In 1999, 25 commercial passenger fishing vessel operators (18 fishing, 10 consumptive diving, 3 both fishing and consumptive diving), accounted for 176,700 person-days of activity in the CINMS (158.8 thousand person-days of fishing and 17.9 thousand person-days of consumptive diving). In addition, private boats accounted for 261.2 thousand person-days of activity within the CINMS (214 thousand person-days of fishing and 47.2 thousand person-days of consumptive diving).

In 1999, sports fishing and consumptive diving activity in the CINMS generated \$24.7 million in income (including multiplier impacts), which supported 654 full and part-time jobs in the three-county area of Santa Barbara, Ventura, and Los Angeles counties. The commercial passenger fishing vessel industry received direct revenues of almost \$8.8 million with over \$420 thousand in profits. In addition, the recreators received about \$15.5 million in consumer's surplus (nonmarket economic user value) (see glossary for definitions of "consumer's surplus" and "nonmarket economic user value") (Leeworthy and Wiley 2003).

3.5.6.3 Kelp Harvesting

Giant kelp was first harvested along the California coast during the early 1900s (Leet *et al.* 2001). Many harvesting companies operated from San Diego to Santa Barbara beginning in 1911. Those companies primarily extracted potash and acetone from kelp for use in manufacturing explosives during World War I. In the early 1920s, having lost the war demand, kelp harvesting virtually stopped. In the late 1920s, giant kelp was again harvested off California.

Giant kelp is now primarily harvested in California for extraction of alginates and other compounds and to supply feed for abalone aquaculture companies. It is also used for the herring-roe-on-kelp fishery in San Francisco Bay (Leet *et al.* 2001). Giant kelp is now one of California's most valuable living marine resources and in the mid-1980s supported an industry valued at more than \$40 million a year. The annual harvest has varied from a high of 395,000 tons in 1918 to a low of less than 1,000 tons in the late 1920s. Such fluctuations are primarily due to climate and natural growth cycles, as well as market supply and demand. From 1970 to 1979, the annual harvest averaged nearly 157,000 tons, while from 1980 to 1989 the average annual harvest was only 80,400 tons. The harvest was low in the 1980s because the kelp forests were devastated by the 1982–1984 El Niño and accompanying storms, and by the 200-year storm that occurred in January 1988. In most areas, the beds of giant kelp recovered quickly, with the return of cooler, nutrient rich waters. Harvests in California increased to more than 130,000 tons in 1989 and to more than 150,000 tons in 1990.

In the Sanctuary region, ISP Alginates was the only company harvesting giant kelp (Ugoretz 2002), though several small-scale harvesters operate along the mainland coast. During the 1990s, increasing international competition from Japan for the "low end," or less purified end of the sodium alginate market caused ISP Alginates to reduce harvests by about 50 percent (Leet *et al.* 2001). Previously, ISP Alginates anticipated California's harvest in this decade would be approximately 80,000 tons annually. The company uses specially designed vessels that have a cutting mechanism on the stern and a system to convey the kelp into the harvester bin. A propeller on the bow slowly pushes the harvester stern-first through the kelp bed, and the reciprocating blades mounted at the base of the conveyor are lowered to a depth of three feet into the kelp as harvesting begins. Regulations state that kelp may be cut no deeper than four feet beneath the surface. The cut kelp is gathered on the conveyor and deposited in the bin. These vessels can each collect up to 600 tons of kelp in one day. To facilitate its harvesting operations, the company conducts regular aerial surveys. The survey information is used to direct harvesting vessels to mature areas of kelp canopy with sufficient density for harvesting. In June of 2005, however, ISP Alginates announced that their southern California facility will be shutting down in early 2006 and relocating to Scotland due to increased costs at the southern California facility (McMahon 2005). This

decision has considerable economic implications for southern California; in 1999, kelp harvested from the CINMS and processed in San Diego had a processed value of about \$6 million and generated between \$6.2 and \$7.8 million in income (including multiplier impacts), which supported 45 to 60 jobs in San Diego County (Leeworthy and Wiley 2003).

With proper management, the surface canopy can be harvested several times annually without damage to the kelp bed (Ugoretz and Parker 2002). However, harvesting kelp may have adverse effects on other inhabitants of the kelp forest community because the kelp canopy serves as important habitat for juvenile fishes (Carr 1989) and many species of invertebrates (Coyer 1979, Watanabe 1984). For example, significant reductions in turban snail species were observed in harvested areas compared with unharvested areas in Carmel Bay (Hunt 1977). Others, however, reported that kelp harvesting has little effect on the overall abundance of kelp forest fishes and invertebrates, even though numerous organisms are removed along with the cut fronds (Miller and Geibel 1973; North and Hubbs 1968). Clearly more research is needed to determine the extent to which kelp harvesting affects populations of canopy-dwelling species. It is worth noting that not all effects of harvesting are necessarily detrimental to the forest community. Removing the canopy increases light reaching the bottom and leads to increased recruitment and growth of giant kelp and understory algae (Reed and Foster 1984). Higher production of understory algae in areas of reduced kelp canopies has been linked to increases in food chain support for some reef fishes (Schmitt and Holbrook 1990).

3.5.6.4 Aquaculture

Aquaculture is the practice of culturing, growing and harvesting an aquatic species in a controlled setting. California has approximately 400 registered aquaculturists who raise products within intensive systems (Resources Agency of California 1997). Currently, Ecomar is using several of the OCS oil and gas structures in the Study Area to raise aquacultural products, such as mussels and other invertebrates. Eight-five percent of the state mussel production and 91 percent of abalone production occurs on land adjacent to the Study Area (Resources Agency of California 1997).

In addition to potentially disturbing the seabed, aquaculture operations have the potential to introduce anoxic conditions, disease pathogens, and exotic species into the environment. For example, Drake's Estero, which is located northwest of San Francisco, has supported productive commercial fisheries for oysters since the 1960s. However, after the introduction of Pacific oysters (*Crassostrea gigas*) from Japan, native oyster species in Drake's Estero exhibited up to 7 percent mild systemic and localized haplosporidian infections (Friedman 1996). Little is known regarding the extent of invasion and damage to marine resources of the Channel Islands from the inadvertent or intentional release of exotic species. Damages from exotic species can range from habitat alteration or destruction, introduction of pathogens threatening human health, and/or predation or competition with native species.

3.5.6.5 Regulatory Setting

A variety of regulations are currently used to manage fisheries in the CINMS. These include total prohibitions on the take of certain species, seasonal closures, and other regulations. Tables 3.5-7a and 3.5-7b summarize some of the major commercial and recreational, respectively, fishing regulations currently in place in southern California. These tables are not complete listings of fishing regulations, but are included to show the level of protection currently provided to certain species or species groups. Marine reserves and conservation areas have recently been established that also regulate fishing activity in CINMS in addition to the regulations listed in Table 3.5-7a and 3.5-7b. Fishery seasons are established and regulated by the California Fish and Game Commission and regulated by the CDFG. Fishery seasons are also established and regulated by NMFS, based on the advice and recommendations of the Pacific

Fishery Management Council, and in coordination with the State of California, for federal waters off of California.

3.5.7 Marine Bioprospecting

Biodiversity prospecting, or bioprospecting, is the activity of seeking a useful application, process, or product in nature. In many cases, bioprospecting is a search for useful organic compounds in microorganisms, plants, and fungi (NPS 2003). Bioprospecting in the ocean can provide products other than seafood, such as ornamental marine life, raw materials, and medicines. For example, marine bioprospecting collected an extract (arabinosides) from the sponge *Tethya crypta* that led to more than \$50 million in annual sales of derived antiviral medicines (NMFS 2001; Norse 1993). The most common use of marine bioprospected materials to date is for the production of pharmaceuticals.

What differentiates marine bioprospecting from other extractive activities (such as commercial fishing or kelp harvesting) is the genetic value of the bioprospected resource. For example, studies of the biomedical properties of various sea cucumber chemical extracts, such as saponins, and chondroitin sulfates, are being conducted by Western medical researchers investigating the efficacy of these substances for pharmaceutical products (Leet *et al.* 2001).

Marine bioprospecting may include sampling and can lead to extraction of a living marine resource for commercial purposes. Within the CINMS, there is no known bioprospecting at this time. However, there are MMS funded research projects investigating the potential beneficial properties of marine life attached to the submerged structure of a sample of offshore oil platforms in the Santa Barbara Channel. The implications of marine bioprospecting within the Study Area are not clearly understood. Nonetheless, removing marine life or plants for bioprospecting may potentially lead to habitat and ecosystem alterations.

3.5.7.1 Regulatory Setting

The NPS (2001) describes its management goal with respect to bioprospecting as follows: “Bioprospecting can sometimes be a consequence of an academic science project. Clearly, such serendipitous bioprospecting is allowed and even encouraged by federal law and NPS policy. Other bioprospectors have a clear goal such as discovering a new medicine or a new enzyme or other useful compound. Targeted bioprospecting is also allowed in the NPS since it is a part of broad scientific inquiry. Harvesting is not allowed. A wide range of scientific inquiry is encouraged and permitted as long as it will not lead to adverse impacts on park resources or values. Biological material is never sold to researchers, nor may they acquire ownership rights in any other way. Just as the National Institutes of Health (NIH) grant permittees license to use biological materials acquired from NIH in exchange for certain negotiated benefits without transfer of ownership, park research permits do not grant any exclusive or propriety rights to the researcher.”

The NPS has dealt with this issue and established policies. The NPS (2001) notes: “Any scientist who wants to study microorganisms in national parks must get a research permit. Research permits are only issued to legitimate scientists who can show that they will not harm national parks in any way. Permits are never issued for harvesting natural products. In fact, federal regulations prohibit harvesting of any natural product from national parks. Scientists are only allowed to take small research samples out of the park and they are not allowed to sell or commercialize those research samples. If a scientist makes a practical or useful discovery during his or her research, the scientist's knowledge may be commercialized, but never the national park sample.”

Table 3.5-7a

General Summary of Commercial Fishing Prohibitions in Southern California

Species	Gear Type	Regulated Season	Regulations
Abalone			Abalone may not be taken, possessed, or landed for commercial purposes.
All Groundfish (some exceptions)	All Gear Types	March 1 – April 30	Closed Season
All Groundfish (some exceptions)	Non-trawl (Fixed)	Jan 1 – Dec 31	Fishing is prohibited in waters greater than 60 fathoms and less than 150 fathoms south of Point Conception.
All Groundfish (some exceptions)	Trawl	Jan 1 – Feb 28 and Nov 1 – Dec 31	Fishing is prohibited in waters greater than 75 fathoms and less than 150 fathoms along the mainland, and from the shoreline to 150 fathoms around the islands.
All Groundfish (some exceptions)	Trawl	Mar 1 – Oct 31	Fishing is prohibited in waters greater than 100 fathoms and less than 150 fathoms along the mainland, and from the shoreline to 150 fathoms around the islands.
Sheephead	All Gear Types	March 1 – April 30	Closed Season
All Species – Marine Resources Protection Zone	Gill Nets and Trammel Nets		Prohibited in waters less than 70 fathoms or within 1 nautical mile, whichever is less, around all of the Channel Islands ¹
Rockfish	Gill Nets and Trammel Nets		Use Prohibited in State waters for the take of rockfish.
Rockfish & Lingcod	Gill Nets and Trammel Nets		Prohibited in waters less than 70 fathoms in depth south of Point Sal, except drift and set gill nets shall not be used in waters less than 100 fathoms in depth at Sixty-Mile Bank. Prohibition on the take of rockfish in State waters applies.
Swordfish & Shark	Drift Gill Nets	Feb 1 – April 30	Closed Season
Swordfish & Shark	Drift Gill Nets	May 1 – Aug 14	Use prohibited within 75 nautical miles of the mainland coast between the westerly extension of the CA-OR boundary and the westerly extension of the US-Mexico boundary.
Swordfish & Shark	Drift Gill Nets	May 1 – July 31	Use prohibited within 6 nautical miles westerly, northerly, and easterly of the shoreline of San Miguel Island between a line extending 6 nautical miles west from Point Bennett and a line extending 6 nautical miles east from Cardwell Point and within 6 nautical miles westerly, northerly, and easterly of the shoreline of Santa Rosa Island between a line extending 6 nautical miles west

¹ All Channel Islands include San Miguel, Santa Rosa, Santa Cruz, Anacapa, San Nicolas, Santa Barbara, Santa Catalina, and San Clemente.

Species	Gear Type	Regulated Season	Regulations
			from Sandy Point and a line extending 6 nautical miles east from Skunk Point.
Swordfish & Shark	Drift Gill Nets	May 1 – July 31	Use prohibited within 10 nautical miles westerly, southerly, and easterly of the shoreline of San Miguel Island between a line extending 10 nautical miles west from Point Bennett and a line extending 10 nautical miles east from Cardwell Point and within 10 nautical miles westerly, southerly, and easterly of the shoreline of Santa Rosa Island between a line extending 10 nautical miles west from Sandy Point and a line extending 10 nautical miles east from Skunk Point.
Swordfish & Shark	Drift Gill Nets	Dec 15 – Jan 31	Use prohibited in ocean waters within 25 nautical miles of the mainland coast.
Squid	Round Haul Nets	Jan 1–Dec 31	Season closed from noon Friday until noon Sunday each week.
Yellowtail, barracuda, white seabass, salmon, steelhead, striped bass, and shad	Round Haul Nets		Use prohibited to take these species.
All Species	Trawl Nets		Prohibited out to 3 miles offshore mainland coast. (Except California halibut trawl grounds, 1-3 miles offshore between Pt. Arguello and Pt. Mugu). Special restrictions apply.
Halibut	Trawl Nets	March 15 – June 15	Closed Season - California Halibut Trawl Grounds. Use prohibited in waters 1-3 nautical miles from the mainland shore between Pt. Arguello and Pt. Mugu.
Pink Shrimp	Trawl Nets	Nov 1 –March 31	Closed Season for Pacific Ocean Shrimp.
Prawns & Shrimp	Traps		Use prohibited from Point Conception south to the Mexican border inside 50 fathoms depth.
Spot Prawn	Traps	Nov 1 –January 31	Closed Season between line drawn due west from Pt. Arguello and US-Mexico boundary.
Spot Prawn	Trawl		Use prohibited
Sea urchin (Red)		Various Closures - April through October	In April - May, September - October the closed days are Friday through Sunday. In June and August the closed days are Thursday through Sunday. In July the closed days are Wednesday through Sunday.

Table 3.5-7a, Page 2 of 2

Note: This is not a complete reproduction of all fishing regulations (e.g., size limits and gear restrictions) and should not be used for legal compliance. **Source:** CDFG 2002.

Table 3.5-7b

General Summary of Recreational Fishing Prohibitions in Southern California

Species	Regulated Season	Regulations
Abalone		May not be taken
Garibaldi, giant (black) sea bass, gulf and broomtail grouper, canary rockfish, cowcod rockfish, yelloweye rockfish, white shark		May not be taken
Grunion	4/1 – 5/31	Closed Season
Rockfish, cabezon, greenlings, CA sheephead, ocean whitefish, and bocaccio.	1/1 – 2/28	Closed Season for boat-based anglers; open year-round for divers and shore-based anglers ¹ .
Rockfish, cabezon, greenlings, CA sheephead, ocean whitefish, and bocaccio	3/1 – 4/15	Take is prohibited in waters greater than 60 fathoms and less than 30 fathoms south of Point Conception.
Rockfish, cabezon, greenlings, CA sheephead, ocean whitefish, and bocaccio	4/16 – 8/31, and 11/1-12/31	Take is prohibited in waters greater than 60 fathoms south of Point Conception.
Rockfish, cabezon, greenlings, CA sheephead, ocean whitefish, and bocaccio	9/1-10/31	Take is prohibited in waters greater than 30 fathoms south of Point Conception.
CA scorpionfish (sculpin)	1/1 – 9/30	Closed Season for boat-based anglers; open year-round for divers and shore-based anglers.
CA scorpionfish (sculpin)	10/1-10/31	Take is prohibited in waters greater than 30 fathoms south of Point Conception
CA scorpionfish (sculpin)	11/1-12/31	Take is prohibited in waters greater than 60 fathoms south of Point Conception
Lingcod	1/1-3/31, and 12/1-12/31	Closed Season for boat-based anglers, divers, and shore-based anglers.
Lingcod	April 1 – April 15	Take is prohibited in waters greater than 60 fathoms and less than 30 fathoms south of Point Conception.
Lingcod	4/16 – 8/31, and November 1-November 30	Take is prohibited in waters greater than 60 fathoms south of Point Conception.
Lingcod	9/1-10/31	Take is prohibited in waters greater than 30 fathoms south of Point Conception.
Lobster	First Thur. after 3/15 to the Fri. before the 1st Wed. in October	Closed Season
Salmon	9/29 – 4/2	Closed Season

Note: This is not a complete reproduction of all fishing regulations (e.g., size limits and gear restrictions) and should not be used for legal compliance. **Source:** CDFG 2002.

3.5.8 Nonconsumptive Recreation and Tourism

Nonconsumptive recreational activities occur primarily in nearshore areas, particularly along the mainland and around the Channel Islands. Examples of common nonconsumptive recreational and tourist-related activities include nonconsumptive diving, boating (including motor boating and sailing), personal watercraft use (along the mainland shore), whale watching, and kayaking/sightseeing (this would include other wildlife viewing and scenic viewing).

3.5.8.1 Nonconsumptive Recreation and Tourist-Related Use

In 1999, nonconsumptive recreational and tourist-related uses accounted for 42 thousand person-days of use in the CINMS (excluding activity from private boats, which has not been estimated). Twenty-six charter/party/guide services brought passengers to the CINMS. Whalewatching accounted for almost 26 thousand person-days, nonconsumptive diving almost 11 thousand person-days, sailing about 4 thousand person-days, and kayaking/sightseeing a little over 12 hundred person-days.

In 1999, nonconsumptive recreation and tourist-related uses generated over \$5 million in income, which supported 179 full and part-time jobs in Santa Barbara, Ventura, and Los Angeles counties. The charter/party/guide service industry received direct revenue from this activity of almost \$2.6 million, with net profits of about \$83 thousand. In addition, the recreators/tourists received almost \$1.5 million in consumer's surplus (nonmarket economic use value) (Leeworthy and Wiley 2003).

CINP Visitation and Activities

There are several types of activities that occur in or near the CINMS that are associated with the CINP. Table 3.5-8 depicts annual visitation to the CINP since 1995. In 2003, an estimated 60,000 people visited and explored the waters associated with the CINP while 30,000 people visited the islands themselves.

The statistics in Table 3.5-9 do not include lesser amounts of air traffic above the northern Channel Islands, including (1) private or commercially hired flights landing on islands to transport persons not visiting the CINP (e.g., The Nature Conservancy property visitors), (2) private or commercially chartered flights transporting Park personnel, and (3) private aircraft flying over the CINMS and CINP.

Although many visitors access the CINP by boat, aircraft visitation also occurs. Table 3.5-9 depicts aircraft-based public visitation statistics from the CINP from 1995.

Table 3.5-8
Annual Visitors to Channel Islands National Park, 1995–2003

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total Park Visitors	12,600	12,749	17,313	12,365	15,649	12,301	19,388	11,825	60,000

Source: From Channel Islands National Park visitation statistics. 1995–2002. National Park Service Public Use Statistics Office. National Park Service. U.S. Department of the Interior. www2.nature.nps.gov; and 2003 data from www.nps.gov/chis/homepage.

**Table 3.5-9
Aircraft-based Public Visitation for Channel Islands National Park, 1995–2002**

	1995	1996	1997	1998	1999	2000	2001	2002
No. of Aircraft Flights to Santa Rosa Island by Park Concessionaires (for Park Visitation Trips only)	18	41	81	112	130	86	57	73
No. of Park-visiting Passengers Aboard Aircraft Flights to Santa Rosa Island by Park Concessionaires	123	207	458	587	763	375	158	456

Source: From Channel Islands National Park visitation statistics. 1995–2002. National Park Service Public Use Statistics Office. National Park Service. U.S. Department of the Interior. www2.nature.nps.gov.

3.5.8.2 Motorized Personal Watercraft

Motorized personal watercraft (MPWC), as defined by the NPS, means a vessel, usually less than 16 feet in length, which uses an inboard, internal combustion engine powering a water jet pump as its primary source of propulsion. The vessel is intended to be operated by a person or persons sitting, standing or kneeling on the vessel, rather than within the confines of the hull. The length is measured from end to end over the deck excluding sheer, meaning a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline. Bow sprits, bumpkins, rudders, outboard motor brackets, and similar fittings or attachments, are not included in the measurement. Length is stated in feet and inches. 36 CFR 1.4(a). The recreational use of MPWCs is a year-round activity, with the majority of operators located in the coastal nearshore portion of the Study Area during spring and summer.

In general, the use of MPWCs is controversial due to concerns about their impacts upon human safety (not addressed here); noise pollution; air and water quality; and wildlife and their habitats.

While industry sponsored studies indicate that MPWCs are no louder than similar motorized vessels under analogous conditions, other studies indicate that because MPWCs travel repeatedly in the same area, continually leaving and reentering the water, they create rapid cycles of noise that disturb humans and wildlife (MOCZM 2002). Since most MPWC use occurs during the spring and summer, it has the potential to interfere with migration, feeding, nesting, and reproduction of wildlife. In addition, the maneuverability and shallow-water capabilities of MPWCs allow them to access sensitive and near-shore habitats (MOCZM 2002). Studies have shown that the use of MPWCs in nearshore areas can increase flushing rates, reduce nesting success of certain bird species, impact spawning fish, and reduce fishing success (Burger 1998, Snow 1989). The National Park Service (2000, 2004) identified several of these impacts along with interruption of normal activity, avoidance and displacement, loss of habitat use, interference with movement, direct mortality, interference with courtship, alteration of behavior, change in community structure, elevated noise levels, and damage to aquatic vegetation. Further, offshore marine mammals or surfacing birds may be unaware of the presence of these vehicles due to their low frequency sound; when the inability to detect the vehicles is combined with their high speed and rapid and unpredictable movements, both animals and operators are at risk (Snow 1989).

See also the discussion of MPWC in Chapter 2.

Although U.S. EPA studies have shown that 30 percent of non-road air pollution emissions stem from motorboats, jetboat, and MPWC engines combined, researchers have not been able to determine the particular contribution of MPWCs to either air or water pollution (MOCZM 2002). Water quality concerns related to use of MPWC, and in particular those with two-stroke engines, include discharge of oil and gas, and air pollutants such as volatile organic compounds, nitrogen oxides, particulate matter, and carbon monoxide (NPS 2000, 2004). The noise, air, and water pollution generated by MPWCs may adversely impact the living marine resources within the CINMS and throughout the Study Area through direct disturbances as well as environmental degradation. The following concerns regarding MPWCs were identified during NOAA's review of this issue:

- MPWCs are different from other types of motorized watercraft in their structure (smaller size, shallower draft, two-stroke engine, and exhaust venting to water as opposed to air) and their operational impacts (operated at faster speeds, operated closer to shore, make quicker turns, stay in a limited area, tend to operate in groups, and have more unpredictable movements);
- MPWCs have been operated in such a manner as to create a safety hazard to other resource users in the vicinity and interfered with other marine recreational uses;
- MPWCs may interfere with marine commercial users;
- MPWCs may disturb natural quiet and aesthetic appreciation; and
- MPWCs present a current and potential threat to resources and users of the marine environment.

Since 2000, because of the NPS ban of MPWC use within waters of the CINP, there has been no legal MPWC activity in that portion of CINMS. According to sightings from the Sanctuary's aerial monitoring program, the activity has occurred only rarely within CINMS. CINP has observed an increase in use of MPWC within the Park over the last several years, and Park staff issue several dozen warnings per year for violation of this ban (Fitzgerald 2005). However, along the mainland shoreline many participated in MPWC via access from mainland marinas and harbors. In 2002, an estimated 8,335 person-days of activity (from rental and private boats) took place along the shoreline of the Study Area (Ehler and Tetra Tech 2002). There was one rental business in Santa Barbara. In the two-county area of Santa Barbara and Ventura counties, this activity generated \$399 thousand in income (including multiplier impacts), which supported 12 full and part-time jobs in the local economies.

3.5.8.3 Recreational Boating

Sailing and boating are popular recreational activities within the CINMS and larger Study Area. The Channel Islands are within reach of several ports for single or multi-day trips (CDFG 2002). Motorboats (including sailboats when using motors) yield impacts such as noise, and air and water pollution, which vary depending on factors such as the size, condition, and type of engine used. Vessels under sail and motor power have the potential to disturb marine life directly, and using and setting anchors can cause seabed disturbances.

Kayaking, when done responsibly, is a virtually no-impact sport. However, disturbance to seabird colonies and nesting sites may occur when kayakers travel too close to these sensitive areas. To avoid predators, cormorants, pelicans, oystercatchers and other seabirds roost on ledges, rocks, and pinnacles away from land. These roosting areas are, however, often within the range of kayakers. If approached

too closely, these birds will abandon their rookeries, leaving nests and young. Three species of seabirds, pigeon guillemots, oystercatchers, and Xantus' murrelets, nest in caves and are very susceptible to disturbance by kayakers entering these caves. A single disturbance may cause the loss of an entire season's young. In addition, pinnipeds at haul-out and rookery areas are very susceptible to a close approach from a kayak or small boat. Such animals will stampede into the water if approached too closely. With larger species such as California sea lions and northern elephant seals, pups can be trampled to death in a stampede. Chronic disturbances have resulted in the abandonment of some rookeries and haul-out sites in various regions.

See the previous section for a discussion of MPWC.

Boat Landings and Boat Landing Structures within the CINMS

There are several structures located on the Islands to accommodate boat landings. Primary structures associated with the northern Channel Islands include:

Anacapa Island. There are two moorings near the landing cove at East Anacapa Island. These are reserved for use by the NPS, USCG, and the NPS concessionaire. Private boaters must anchor a reasonable distance from these moorings.

Santa Cruz Island. Private boaters may land on the eastern 24 percent of Santa Cruz Island without a permit at any time. This area is managed by the NPS and is east of the property line between Prisoners Harbor on the north side and Valley Anchorage on the south side.

Santa Rosa Island. Boaters may land along the coastline and on beaches with a permit for day-use only. Beaches between and including Skunk Point and East Point are closed from March 1st to September 15th in order to protect the threatened western snowy plover (a seabird). Sandy Point at the west end is closed to landings year round. There is also a pier at Bechers Bay.

San Miguel Island. There are no piers or moorings at San Miguel Island; therefore, all private boaters must anchor. Overnight anchorages are restricted to Cuyler Harbor and Tyler Bight. Visitors may land only on the beach at Cuyler Harbor. No landing is allowed on rocks or islets.

Santa Barbara Island. The landing dock is available for unloading purposes only. No craft, including kayaks and inflatables, should be left moored to the dock.

In 1999, eight for-hire operations accounted for over 4,000 person-days of sailing and four operators accounted for over 12 hundred person-days of kayaking/sightseeing in the CINMS (information on private boats is not available). These operations received revenue of about \$390 thousand and earned a little over \$27 thousand in profit from these activities. These activities generated over \$797 thousand in income, which supported 24 full and part-time jobs in Ventura and Los Angeles counties. In addition, those that participated in these activities received over \$189 thousand in consumer's surplus (nonmarket economic use value) (Leeworthy and Wiley 2003).

3.5.8.4 Non-Consumptive Diving

If done correctly and if visits to any one site are minimized, non-consumptive diving can have limited impacts on marine habitats and can be an excellent mechanism for accessing and enjoying Sanctuary resources. However, overuse of popular locations or poor diving techniques can result in damage to CINMS resources including living marine resources and their habitats, and submerged cultural resources.

Benthic organisms are susceptible to divers intentionally or accidentally holding, touching, picking up, or covering organisms with sand. Divers entering from the beach can also impact rocky shore habitats.

In 1999, seven for-hire operations accounted for almost 11,000 person-days of nonconsumptive diving in the CINMS (information on nonconsumptive diving from private boats was not available). These seven operations received about \$688,000 in revenue and earned about \$46,000 in profit from this activity. This activity generated almost \$1.6 million in income, which supported 47 full and part-time jobs in the three-county area of Santa Barbara, Ventura, and Los Angeles counties (including multiplier impacts). In addition, those participating in nonconsumptive diving received about \$389 thousand in consumer's surplus (nonmarket economic user value) (Leeworthy and Wiley 2003).

3.5.8.5 Surfing and Windsurfing

Numerous popular surfing areas exist along the mainland shorelines within the Study Area. In addition, there are several surfing areas located around the Channel Islands, although they are not well documented. Boat or shore-based access to surfing and windsurfing areas has the potential to create disturbances of sensitive marine mammals or seabirds.

3.5.8.6 Wildlife Viewing

Wildlife viewing, especially whalewatching, occurs along the coast and at the islands. Whalewatching in the Channel Islands is extremely popular due to the high frequency of sightings and diversity of marine mammals to be seen. Day trips are offered from several area landings including Santa Barbara, Ventura, and Channel Islands harbors. Whalewatching can have negative effects on whale behavior when conducted improperly. Boats that approach too fast or too close can disrupt whale feeding, mating, migration, and other activities. Vessels can stay with the whales too long, especially when other vessels are waiting their turn for a closer look. Observations of interactions between humpback whales and vessels (including but not limited to whale watching vessels) have included whales approaching vessels, directing threats at vessels, and avoiding vessels by altering their behavior (e.g., increasing dive time, reducing surface time, surfacing without blows, initiating dives without raising flukes, and altering direction away from approaching vessels) (Au *et al.* 2000). Au *et al.* (2000) concluded that noise from vessels representative of the humpback whale watching industry in Hawaii, and maintaining the standoff distance of 91 meters required in Hawaii, should not cause harm to the whales' auditory systems. However, this study did not yield evidence as to whether or not the presence of the vessels, and the noise they generate, led to behavioral changes in the observed whales. Researchers studying killer whale watching in an ecological reserve in British Columbia found that the likelihood of whales leaving the reserves increased as increasing numbers of boats entered the area (Williams *et al.* 2002). Williams *et al.* (2002) found that in an experimental setting in which a vessel maintained a distance of 100 meters from killer whales, male killer whales covered 13% more distance along a circuitous path than that covered before the boat arrived, while female killer whales swam 25% faster. Beyond observations in experimental conditions, Williams *et al.* (2002) observed actual whale watching activities and found that: as boats got closer to males their swimming paths became less direct, they tended to swim faster, and their surface behaviors increased; as the number of whale watching boats increased the males' paths became more direct, they tended to swim slower, and their surface behaviors decreased; as boats got closer to females their paths were erratic but directional, and their dives tended to be shorter; as the number of boats increased the females' paths were less direct, and their dives were shorter. These observations likely result from the cumulative effect of numerous factors rather than a simple response of whales to whale watching vessels (e.g., age of animals, date and time of observation, total number of vessels, proximity of nearest vessel to whales) (Williams *et al.* 2002); however, these examples are indicative of whales altering their behavior in the presence of whalewatching vessels. The implications of such

behavioral modifications are not well understood. The effects of vessel-based wildlife viewing coupled with other vessel traffic can have a negative cumulative impact on whales.

In 1999, eight for-hire operations accounted for almost 26,000 person-days of whalewatching activity in the CINMS (information on whalewatching from private boats is not available). These eight operators received about \$1.5 million in revenue and earned a little over \$9,000 in profits from this activity. This activity generated over \$3.6 million in income (including multiplier impacts), which supported 108 full and part-time jobs in Santa Barbara and Ventura counties. In addition, whalewatchers received almost \$938,000 in consumer's surplus (nonmarket economic user value) from their whale watching activities in the CINMS (Leeworthy and Wiley 2003).

3.5.8.7 Regulatory Setting

The NPS currently prohibits the use of MPWCs within waters of the CINP.

3.5.9 Department of Defense Activities

The U.S. Air Force and U.S. Navy conduct training exercises, provide logistic support, and conduct military testing and evaluation projects for aircraft, ship, and missile programs in the Study Area. Vandenberg Air Force Base (AFB), and the Naval Base Ventura County (NBVC) at the Point Mugu and Port Hueneme coastal areas are the primary locations for these testing and training exercises. The following presents an analysis of the current level of U.S. Air Force and U.S. Navy military activities in the Study Area. Finally, operations of the USCG are discussed.

3.5.9.1 Vandenberg AFB

Overview

Vandenberg Air Force Base (AFB) is located on California's central coast between Los Angeles and San Francisco, about 55 miles northwest of Santa Barbara. Vandenberg's unique location provides 42 miles of Pacific Ocean shoreline, over 99,000 acres of varied terrain and restricted airspace for spacelift, ballistic test, aeronautical operations, and military exercises. A 15,000-foot runway, boat dock, railway system and several major highways service Vandenberg AFB.

North Vandenberg has a coastline facing west while much of the South Vandenberg coastline faces south. This unique geography permits launch azimuths ranging from 147 to 300+ degrees, enabling over-ocean ballistic and polar space launches. Vandenberg is the only location in the continental United States where spacecraft can be launched into polar orbit without overflying land. In addition, the West Coast Offshore Operating Area (WCOOA) provides about 200,000 square miles of over-water and sea-land transition zones for aeronautical and cruise missile testing.

The types of activities conducted at Vandenberg AFB which have or may have an impact on marine resources can be categorized into the following areas:

- Spacelift Operations
- Intercontinental Ballistic Missile and Missile Defense Testing and Operations
- Missile Testing and Aircraft Operations
- Military Training Exercises
- Boat Dock Operations

A description of each category is provided below.

Spacelift Operations

Spacelift operations consist of launching rockets for the purpose of inserting satellites into earth orbit. Launch vehicles, such as, but not limited to Titans, Atlas and Deltas, are generally composed of multiple stages that are stacked one upon another. Each stage consists of a rocket motor and a supply of propellant (fuel and oxidizer). After the propellant in one stage is consumed, the entire stage is jettisoned from the rest of the launch vehicle and the next stage is fired to resume powered flight. Some launch vehicles are configured with two or more strap-on boosters, which are attached to the sides of the launch vehicle. Strap-on boosters and the vehicle's first stage are fired concurrently in order to provide additional thrust during the initial minutes of flight.

Spent booster stages, strap-on boosters, and other launch vehicle debris are jettisoned into the Pacific Ocean during spacelift operations. Such objects could fall almost anywhere within the CINMS Study Area. Current launch rates indicate up to 5 launches overfly the current CINMS boundary of which one overflies San Miguel Island directly. Presently all spent stages for these trajectories impact outside the CINMS. Historically launch rates for spacelift (southerly trajectories) have varied and future launch rates are subject to change based on mission need. Eleven spacelift operations occurred between 1997, 1998 and 1999. In 1966, the number of spacelift launches peaked at about 46. Future projected launch profiles do not deposit spent stages inside the CINMS.

The need to insert payloads into polar and other highly inclined orbits drives the requirement to launch spacelift vehicles along a wide range of southerly launch azimuths. In addition, different launch vehicles have dissimilar hardware and dissimilar flight characteristics, which further expands the region where launch vehicle debris could fall into the ocean. Active precautionary measures are in place to minimize the likelihood of jettisoned objects falling in the Sanctuary or on oil platforms.

As previously mentioned, a typical booster stage consists of a rocket motor and a large tank used for storing propellant. The size of booster stages vary from vehicle to vehicle, but some of the larger booster stages can have a 10-foot diameter and be nearly 90 feet in height. Large strap-on boosters can have a 10-foot diameter and exceed 110 feet in height. Booster stages, which consist primarily of metal components, fall into the ocean after their propellant has been consumed. Residual amounts of propellant may reside inside booster stages when they fall into the ocean.

Jettisoned objects sink to the ocean floor and are not recovered due to the extreme difficulty in locating and recovering such objects in deep ocean waters. Furthermore, the high costs associated with deep recovery operations would be prohibitive. On rare occasion, launch anomalies occur. Various sized fragments from a destroyed vehicle as well as pieces of unburned solid propellants could be dispersed over a wide area potentially inside portions of CINMS and the Study Area. Liquid propellants would likely burn during the explosion or evaporate shortly thereafter. To date, no "scheduled" or planned spent stages have fallen within the CINMS. There was a launch failure (Titan IV in Aug '93), however, that deposited debris in the CINMS area.

The Department of Defense (DoD), the National Aeronautics and Space Administration (NASA), other government agencies, and various commercial enterprises conduct Spacelift operations at Vandenberg AFB. As the appointed executive agent for space, the Air Force is responsible for ensuring public safety. As such, positive control measures are employed during all missile and space launch activities. All launch vehicles are equipped with flight termination packages and tracking systems that offer operators the ability to terminate thrust or destroy vehicles that follow non-nominal trajectories. DoD personnel are

entrusted with this responsibility during powered flight (the phase of flight when thrust is provided by engines/motors that includes overflight of the Sanctuary and Study Area). In this role, the DoD is responsible for positive flight termination actions taken for all launches whether they are DoD, civilian, or commercial in nature.

Intercontinental Ballistic Missile and Missile Defense Testing and Operations

Vandenberg AFB is the primary location in the United States where Intercontinental Ballistic Missiles (ICBMs) are launched for testing purposes. Ballistic missiles, such as, but not limited to, Peacekeeper and Minuteman, are usually launched to targets located near the Kwajalein Atolls in the South Pacific; however, some missiles are launched to targets in other broad ocean areas. The impact of ballistic missile testing is similar to the impact of spacelift operations.

Spent booster stages fall into the Pacific Ocean during ICBM testing operations. Highly variable testing configurations result in jettisoned objects falling over a wide area of the ocean. Jettisoned objects, and other missile debris, sink to the ocean floor and are not recovered due to the extreme difficulty in locating and recovering such objects in deep ocean waters. Furthermore, the high costs associated with deep recovery operations would be prohibitive. No ICBM missiles have deposited spent stages in the CINMS area. Future missile defense testing could overfly the CINMS; however, none are planned to deposit spent stages in the CINMS.

Missile intercept operations also occur from Vandenberg AFB, where a target missile is destroyed down range by an interceptor missile, laser, or other weapon system. Missile intercept operations result in debris being dispersed over a wide area of the ocean and potentially inside portions of the CINMS Study Area. Active precautionary measures are in place to minimize the likelihood of jettisoned objects falling in the Sanctuary or on oil platforms.

On rare occasion, ICBM and missile defense launch anomalies occur. Various sized fragments from a destroyed vehicle as well as unburned solid propellants and some unburned liquid propellant (upper stages such as post boost vehicles), could be dispersed over a wide area potentially inside portions of the CINMS Study Area, but ICBM past anomalies have not deposited debris in the CINMS.

ICBM and missile defense testing operations at Vandenberg AFB are conducted by DoD. As the appointed executive agent for space, the AF is responsible for ensuring public safety. As such, positive control measures are employed during all missile and space launch activity. All launch vehicles are equipped with flight termination packages and tracking systems that offer operators the ability to terminate thrust or destroy vehicles that follow non-nominal trajectories. DoD personnel are entrusted with this responsibility during powered flight (the phase of flight when thrust is provided by engines/motors that includes overflight of the Sanctuary and Study Area).

Missile Testing and Aircraft Operations

Extending 200 miles offshore and traversing the entire west coast of the United States, the WCOOA provides the ideal airspace for testing military and civilian aircraft, ballistic missiles, guided missiles, and other weapon systems. Most WCOOA tests are conducted off the California coast due to the stable air mass, and due to the radar, telemetry, and optical sensors at Vandenberg AFB and the Naval Air Warfare Center at Point Mugu.

Different types of ballistic and guided missiles are launched from land, sea, and air (over water) for various reasons, including, but not limited to, testing guided missiles, intercept technologies for a national

missile defense system, and testing anti-aircraft artillery. The target area for some short-range missiles may only be a couple miles offshore, which could result in missile debris being deposited into the CINMS Study Area.

Active precautionary measures are in place to minimize the likelihood of jettisoned objects falling in the Sanctuary or on oil platforms. Currently, no past (or projected future) missile system launched from VAFB deposited spent stages in the CINMS area. Past aircraft overflight operations have occurred inside the CINMS, and such activity is expected to continue in the future, however.

Other operations conducted in the WCOOA consist of aircraft and aeronautical test operations. Airspace corridors (over-land and over-water) are routinely used for aircraft flight test operations. In addition, aircraft from other military installations routinely use the 15,000-foot landing strip at Vandenberg AFB for refueling and training exercises. Training exercises, involving both fixed wing and rotor aircraft, are conducted at all altitudes within the CINMS Study Area. Devices used for training include, but are not limited to, flares, chaff, and sea dye. Water survival training is also conducted within the study area, which consists of, but is not limited to, simulating emergency egress through a cockpit, practicing life raft usage, and hoisting people from the ocean. Low altitude flights near the shore of the islands are infrequent, but do occur occasionally.

Missile testing and aircraft operations in the WCOOA are conducted by DoD. As the executive agent for space, the Air Force is responsible for ensuring public safety. As such, positive control measures are employed during all missile and space launch activity. Except for some small missile systems having a maximum affected flight area entirely over water and away from populated areas (including oil platforms), all launch vehicles are equipped with flight termination packages and tracking systems that offer operators the ability to terminate thrust or destroy vehicles that follow non-nominal trajectories. DoD personnel are entrusted with this responsibility during powered flight (the phase of flight when thrust is provided by engines/motors that includes overflight of the Sanctuary and Study Area).

Military Training Exercises

Periodically, the Vandenberg AFB shoreline is used for military training exercises, which usually involve the movement of military personnel from ocean vessels and aircraft to the shore.

Boat Dock Operations

Vandenberg AFB is serviced by a boat dock. Boat dock operations include, but are not limited to, the unloading of rocket motors and large booster segments from barges. The boat dock is located within the CINMS Study Area and will require to be dredged from time to time.

Launch Discussion

Current launch rates indicate that up to 5 launches overfly the current CINMS boundary, of which one overflies San Miguel Island directly. Presently all spent stages for these trajectories impact outside the CINMS.

Table 3.5-10 Space Vehicle Launches from Vandenberg Air Force Base, Sonic Boom Measurements, Northern Channel Islands

Launch Vehicle	Date	Launch Site	Island Monitoring Location	Sonic Boom Peak Amplitude (psf)	Sound Exposure Level (dB) [A-weighted]
Titan IV	12 May 1996	SLC-4E S. VAFB	Crook Point, San Miguel	8.97	97.2
Titan IV	23 Oct 1997	SLC-4E S. VAFB	Kinton Point, Santa Cruz	1.1	86.8
Athena 2	27 Apr 1999	SLC-6 S. VAFB	Adams Cove, San Miguel	0.95	73.4
Titan IV	22 May 1999	SLC-4E S. VAFB	Harris Point San Miguel	1.84	78.5
Athena 2	24 Sep 1999	SLC-6 S. VAFB	Point Bennett, San Miguel	0.96	68.3
Delta II	21 Nov 2000	SLC-2 N. VAFB	Point Bennett, San Miguel	0.4	91.5
Atlas II	8 Sep 2001	SLC-3E S. VAFB	Cardwell Pt., San Miguel	0.75	79.4
Delta II	18 Oct 2001	SLC-2 N. VAFB	Point Bennett, San Miguel	0.0	83.5 (unweighted)
Delta II	11 Feb 2002	SLC-2 N. VAFB	Point Bennett, San Miguel	0.64	84.7
Atlas II	2 Dec 2003	SLC-3E S. VAFB	Point Bennett, San Miguel	0.88	99.310/7/2004

References: SRS Technologies monitoring reports

Historically launch rates for spacelift (southerly trajectories) have varied and future launch rates are subject to change based on mission need. Eleven spacelift operations occurred between 1997, 1998 and 1999. In 1966, the number of spacelifts peaked at about 46. Future projected launch profiles do not deposit spent stages inside the CINMS.

For CINMS, the National Marine Fisheries Service programmatic take permit would be the only applicable existing requirement. Under this permit the Air Force is required to conduct modeling to predict the likelihood of a sonic boom impacting the Channel Islands. No significant impacts have ever been detected, but pinnipeds on the Channel Islands may be briefly disturbed by sonic booms and the take permit allows for this level of impact.

3.5.9.2 United States Navy

The U.S. Navy has an extensive presence in Southern California through installations, offshore operating areas, and ranges (offshore as well as inland). Within the study area, installations are located at Point Mugu and Port Hueneme in Ventura County. These two facilities comprise the unified base command known as Naval Base Ventura County (NBVC). The installations at Point Mugu and Port Hueneme are composed of approximately 6,000 acres of prime real estate and include an airfield, a port facility and

light industrial activities. The installations host various Naval activities including the Pacific Fleet Seabee units, Pacific Fleet Early Warning Aircraft (E-2) squadrons, the Naval Surface Warfare Center Port Hueneme Division, the Naval Facilities Engineering Service Center, and Naval Air Warfare Center Weapons Division (NAWCWD), as well as a variety of other tenant organizations.

NAWCWD Point Mugu operates and controls the Point Mugu Sea Range, a 36,000 square mile area of military controlled airspace off the Southern California Coast (see figure 1). Although some Navy operations in the study area occur outside the Sea Range, most are conducted within the Sea Range boundaries. The Sea Range includes airspace overlying significant portions of the existing Sanctuary (78% of the Sanctuary) as well as the airspace above the land areas of several of the Channel Islands.

The Sea Range was established in 1946 after an extensive nationwide search for an operationally realistic ocean site to conduct testing and development of missiles and other Naval systems. The unique geography of this region, including coastal mountains, offshore islands, convex coastline and relatively good weather, led to the selection and designation of the Sea Range.

The Sea Range continues today to provide the Navy an operationally realistic environment for safely conducting controlled air, surface, and subsurface Navy testing and training. The combination of the geographic factors, instrumentation sites, unique test capabilities, proximity to Naval Forces, and highly skilled workforce provides the most advanced and efficient method for conducting weapon system tests and Fleet training necessary to ensure the readiness of Pacific Fleet units.

In addition to the Navy's presence within the Study Area, the Navy maintains substantial installations, operating areas and training ranges that rely on and enhance the Navy's presence at Point Mugu Sea Range and NBVC. Approximately one-quarter of the United States Fleet is stationed in San Diego, including three aircraft carriers. In addition, the United States Marine Corps maintains a significant presence at Marine Corps Base Camp Pendleton. As part of their interdeployment training cycle, these forces utilize the Point Mugu Sea Range, other operating areas off Southern California, and training ranges as far inland as Nevada and Arizona as they progress from basic unit level training through advanced task force exercises in preparation for the missions they anticipate conducting during overseas deployments. These operations range from single units to battle groups and multi-national exercises.

The Navy conducts a wide variety of activities within the Study Area and boundaries of the existing Sanctuary in support of operational training and testing. The exact activities vary based on current operational requirements, evolving technologies, and world events. The following sections describe baseline categories of activities that occur within the Channel Islands National Marine Sanctuary and the associated Management Plan Study Area.



Figure 3.5-5 Point Mugu Sea Range

Vessel, Aircraft, and Target Operations

Within the Study Area and Sanctuary, the Navy operates the full range of Navy ships, submarines, aircraft, weapons systems, sensors, and targets, including those based at Point Mugu and Port Hueneme, as well as those from other bases. In addition, foreign military units often participate with the Navy in testing and training operations.

U.S. Navy vessels operating in the area, including aircraft carriers, destroyers, cruisers, submarines, and various amphibious and small craft, utilize the Sea Range for testing, training, and experimentation. Also, the U.S. Navy operates a small fleet of specialized support boats and several larger vessels (ships) that support Sea Range operations. Operation of these vessels includes, but is not limited to, transits and operation of all shipboard systems. Ships routinely conduct anti-submarine warfare, surface-to-surface and surface-to-air warfare training, testing, and experimentation. They also perform maritime intercept operations and escort training. These are missions they are routinely required to perform during overseas deployments.

Within the existing Sanctuary, normal routine vessel operations are located primarily in areas outside 1 NM from the islands. Operations closer to the islands would normally be transit and vessels seeking shelter from weather conditions. However, the exact location of vessel operations is dictated by safety and mission requirements. Navy vessels do not discharge or exchange ballast water within the existing Sanctuary.

Aircraft operations include transits, air-to-air and air-to-surface operations involving both manned aircraft and unmanned air vehicles. Aircraft operations occur throughout the area at various altitudes and speeds, including supersonic operations. Overflight of the shorelines of the Channel Islands is normally above 1,000 feet, unless a lower altitude is required to accomplish the mission or training objective (e.g., low-level helicopter flight training). Requirement for such lower altitude flights over shorelines of the islands are rare (several per year) and are carefully planned to minimize noise impacts. Aircraft flights originate from Point Mugu, other bases, and ships at sea.

Targets operated in the study area include both airborne and surface (boats/ships) targets. Airborne targets are remotely controlled and used to test weapon systems such as missiles or radar systems. They range from small missile-size to full airplane size and are designed to be recovered and reused. However, some targets are not recovered or are intentionally intercepted and destroyed. Aerial targets are launched from Point Mugu, San Nicolas Island, surface vessels, or aircraft. Surface targets are remote controlled vessels designed for testing or training in situations where personnel cannot safely be on-board. There is a wide range of surface targets used on the Sea Range. Normally surface targets are designed to withstand extensive damage for reuse. However, some targets include vessels ("hulks") that are intentionally sunk. Lastly, underwater targets are also used by submarines and torpedoes for testing and training. Target operations that involve missile intercepts or sinking targets are rarely performed within the existing sanctuary and are not currently done in the areas close to the islands.

Weapon Activities

The mission of Sea Range is to provide an operationally realistic location to test and evaluate weapon systems as well as to conduct training in the use of these weapon systems. The weapon systems employed cover the breadth of Navy (and DoD) weapons systems, including both offensive and defensive systems. There is an emphasis on missile and air warfare systems. These weapons systems activities generally occur south of the northern Channel Islands or in the vicinity of San Nicolas Island but may occur in other locations within the Study Area. Within the current Sanctuary boundary, weapon activities

are unusual and very limited in scope (e.g., overflight). Missile flights (and their associated safety chase aircraft) in the current Sanctuary boundary normally occur over ocean areas. In general, the categories of weapons can be classified as guns, bombs, missiles, and torpedoes. These weapon systems often do not use live warheads, but actual live fire of weapons does occur. Debris from intercepts is not recovered. The scenarios and conditions employed vary widely depending on the specific weapon system, operational requirement, and platform (aircraft, ship, submarine) employed. For simplicity, weapon systems activities can generally be described in the following categories:

- **Air-to-Air:** Typical scenario would involve aircraft firing missiles at airborne targets and aircraft engaged in air combat maneuvering. Missiles rarely fly over the existing sanctuary and such overflight operations are normally above 1,000 feet. The nature and scope of air-to-air activities involving aircraft firing missiles is documented within the Point Mugu Sea Range Environmental Impact Statement.
- **Air-to-Surface:** Typical scenario would involve aircraft firing weapons against surface (boat) targets or the target complex at San Nicolas Island. Firing of weapons from aircraft at targets does not normally occur within the existing Sanctuary boundary. When weapons are used against surface targets within the Sea Range, protective measures are in place to increase situational awareness of the training participants to minimize and avoid takes of marine mammals under the Marine Mammal Protection Act and Endangered Species Act. The nature and scope of air-to-surface weapons use is documented within the Point Mugu Sea Range Environmental Impact Statement.
- **Surface-to-Air:** Typically involves either ships firing weapons against airborne targets or weapons launched from Point Mugu or San Nicolas Island against airborne targets. Because of safety considerations, surface-to-air weapons are not normally used within the existing Sanctuary boundary. Debris is not normally recovered on the Sea Range. The nature and scope of surface-to-air weapons use is documented within the Point Mugu Sea Range Environmental Impact Statement.
- **Surface-to-Surface:** Typical scenario would be ships or weapon systems at Point Mugu or San Nicolas Island firing missiles or guns against surface targets (either vessels or the SNI target complex). Although missiles and targets are fired from Point Mugu seaward into the Sea Range approximately 150 times per year, they rarely fly directly over the existing Sanctuary boundary. Details of how these activities are conducted are analyzed in the Point Mugu Sea Range Environmental Impact Statement.
- **Subsurface-to-Surface:** Involves submarines firing missiles or torpedoes at surface vessels or land targets. Use of missiles and torpedoes may occur several times each calendar year depending on sea state and operational requirements. Because of safety considerations, these activities do not occur within the existing Sanctuary boundary. These activities are carefully scheduled in advance and require commanders involved in each event to utilize protective measures designed to increase situational awareness of exercise participants to avoid takes under the Marine Mammal Protection Act and Endangered Species Act.
- **Subsurface-to-Subsurface:** Involves submarines firing torpedoes at undersea targets. These engagements may occur several times each calendar year depending on sea state and operational requirements. Because of safety considerations, these activities do not occur within the existing Sanctuary boundary. These activities are carefully scheduled in advance and require

commanders involved in each event to utilize protective measures designed to increase situational awareness of exercise participants to avoid takes under the Marine Mammal Protection Act and Endangered Species Act.

- **Surface-to-Subsurface:** Involves ships firing missiles or torpedoes at undersea targets. These activities may occur several times each calendar year depending on sea state and operational requirements. Because of safety considerations, these activities do not occur within the existing Sanctuary boundary. These activities are carefully scheduled in advance and require commanders involved in each event to utilize protective measures designed to increase situational awareness of exercise participants to avoid takes under the Marine Mammal Protection Act and Endangered Species Act.
- **Air-to-Subsurface:** Involves aircraft firing torpedoes at undersea targets. Use of torpedoes may occur several times each calendar year depending on sea state and operational requirements. Because of safety considerations, these activities do not occur within the existing Sanctuary boundary. These activities are carefully scheduled in advance and require commanders involved in each event to utilize protective measures designed to increase situational awareness of exercise participants to avoid takes under the Marine Mammal Protection Act and Endangered Species Act.

The Sea Range has an extensive and well-established safety program that ensures all areas of potential hazard are clear of non-participants. This program includes public notifications as well as radar and physical searches of operating areas prior to commencement of operations.

Submarine and Antisubmarine Warfare

Submarine operations include, but are not limited to, transits, anti-submarine operations and anti-surface vessel operations. Antisubmarine warfare operations in the Study Area include submarine, deep submergence vehicle, surface vessel, and aircraft operations designed to detect, locate, and prosecute threat submarines or underwater warfare platforms. As discussed above, these operations include torpedo operations and the use of both passive and active acoustic devices. These acoustic devices may be autonomous (e.g. sonobuoys or remote controlled undersea vehicles) or be connected to vessels or aircraft (e.g. sonar systems). Acoustic sources are tonal and explosive and are used for seeking out submarines as well as communicating with U.S. and foreign submarines. Antisubmarine warfare activities also include deployment, maintenance, and abandonment of equipment secured to the ocean bottom, such as cables, hydrophones, or sonar arrays. In addition, naval aviation units conduct anti-submarine warfare training well below 1,000 feet in the Study Area. Within the existing Sanctuary, submarine and antisubmarine warfare operations are rare and normally limited to transiting/maneuvering in the area and passive acoustic systems. To the extent active acoustic devices are used, the precise frequency levels are classified but protective measures are used by training exercise planners to increase situational awareness of unit commanders to ensure received levels by marine mammals in the area of acoustic activity do not result in takes under the Marine Mammal Protection Act and Endangered Species Act.

Mine Warfare

Mine warfare operations include, but are not limited to, mine laying from aircraft, surface vessels and submarines as well as mine sweeping. Within Bechers Bay off Santa Rosa Island, the Navy periodically conducts inert mine drops. On average there are two multi-aircraft mine drop exercises annually. The inert mines are steel jacketed concrete shapes that are often recovered for reuse (roughly 50% recovered). The mine shapes are dropped from aircraft for shallow water minefield deployment training. The drops

are done only after following safety clearance procedures, which ensure the area is clear of all non-participants.

Amphibious and Special Warfare

Amphibious warfare operations in the study area include, but are not limited to, surface vessels, subsurface systems, swimmers, and aircraft/helicopter operations designed to land and secure beaches for subsequent land based operations. The training exercises include manned raids, small craft landing, and special operations force insertions from aircraft, surface vessels or submarines at Point Mugu, Port Hueneme, Vandenberg Air Force Base and oil platforms. Landing operations are not conducted at the islands within the Sanctuary.

Explosive Ordnance Disposal

Explosive Ordnance Disposal operations include, but are not limited to, the location, assessment, disarming and, in some cases, detonation of ordnance and missile propulsion systems. With the exception of an emergency or safety disposal, these activities are not conducted within the boundary of the existing Sanctuary.

Decoys

To provide operationally realistic testing and training the Sea Range scenarios described above often also include the use of decoys, which are devices designed to reduce weapon system effectiveness by confusing sensor systems. Decoy use includes, but is not limited to, chaff, obscurants, flares, and undersea acoustic devices. The use of decoys occurs throughout the Sea Range and may inadvertently occur within the existing boundary of the Sanctuary. Use of decoys within existing Sanctuary boundary is rare because the types of activities being conducted do not normally occur within the existing Sanctuary boundary.

Chaff consists of aluminum strips deployed from aircraft or ships to confuse radar systems. Obscurants consist of smoke used in the study area that is deployed from ships or aircraft and is designed to confuse sensor systems. Flares consist of incendiary devices of two types: defensive flares fired from ships or aircraft designed to confuse heat-seeking missiles, and illumination flares fired from ships designed to provide surface illumination during darkness. Undersea decoys consist of devices that emit acoustic energy and are designed to confuse sensor systems.

Maintenance, Replacement, Removal, and Abandonment of Existing Facilities

Facilities that must be maintained, replaced periodically, or removed or abandoned include permanent facilities at the Navy installations and sites (e.g. pier side maintenance) as well as ocean submarine cables, and other miscellaneous facilities and equipment. Examples include, but are not limited to, hydrophone arrays, communications cables linking the mainland to the offshore islands, or submarine communication systems. A portion of an undersea communication cable running from Point Mugu to San Nicolas Island passes through the existing Sanctuary. Removal of this cable is not anticipated in the foreseeable future. Maintenance of this cable is conducted on a regular and as-needed basis.

Marine Research and Surveys

The Navy conducts oceanographic research and surveys within the Study Area. This activity involves the use of sound sources; sampling; placement of ocean bottom equipment, weather balloons; and the use of

vessels, divers, submarines, and satellites. Diving is also conducted for training and in support of other operations. Research and surveys within the existing Sanctuary are not conducted frequently.

Anchoring of Ships and Vessels

Naval vessels routinely anchor within the Study Area at various locations. Examples include, but are not limited to, range support boats anchoring during bad weather as well as long-term anchoring or mooring of surface target vessels. Vessels larger than 300 gross tons do not normally anchor within the existing Sanctuary and would rarely be within 1 NM of the islands within the Sanctuary.

Harbor Operations

The Navy operates the harbor at Port Hueneme. It is used for berthing of permanently assigned vessels and visiting ships. A portion of the harbor is leased to the Oxnard Harbor District for commercial use. Ships routinely transit through the proposed concept areas as part of naval operations.

Logistics Operations

Various logistics operations occur within the Study Area to support the testing, training, and experimentation operations described above. These include, but are not limited to, refueling operations (both planes and underway vessels), replenishment/re-supply operations (e.g. barges, supply ships, etc.), vessel towing, and salvage activities.

3.5.10 U.S. Coast Guard Activities

The USCG conducts search and rescue, marine environmental protection, law and international treaty enforcement, aids to navigation maintenance, marine safety, defense readiness, and training operations to support these activities within the Study Area.

The USCG operates a Marine Safety Detachment including two 87-foot coastal patrol boats (USCG Cutter *Blackfin*, located at Santa Barbara, and USCG Cutter *Blacktip* located at Oxnard), and a Station, (Station Channel Islands Harbor), and the East Anacapa Island Lighthouse. There is also another small boat station at Morro Bay, California (Station Morro Bay).

Station Channel Islands Harbor has three search and rescue (SAR) boats including a 21-foot boat, 41-foot utility boat, and a 44-foot motor lifeboat. The station provides quarterly maintenance to the East Anacapa Lighthouse. The lighthouse maintenance schedule is coordinated with the NPS. Noise from any heavy equipment is minimized during these maintenance activities. The three small boats are used to conduct smaller caliber fire exercises within the Study Area, and the *Blacktip* is currently used for larger caliber, live fire exercises within the Study Area.

The *Blackfin* is used for SAR and various law enforcement operations such as drug interdiction, migrant interdiction, and fisheries enforcement. The *Blackfin* is also used in live fire exercises within the Study Area. The Marine Safety Detachment conducts pollution response, marine casualty investigations, and annual platform inspections within the Study Area. Civilian crew boats and helicopters are used to transport USCG inspectors to and from the platforms for inspections as well.

The USCG Cutter *George Cobb* is a 175-foot buoy tender used for servicing aids to navigation throughout the area. These aids consist of mooring balls for USCG patrol boats operating in the area and

are located at Smugglers Cove at Santa Cruz Island, Coho Anchorage at Point Conception, and San Simeon. The *George Cobb* is also used to maintain harbor approach and channel buoys for the Santa Barbara, Ventura, Channel Islands, and Port Hueneme harbors. Other navigational and rock/reef warning buoys are maintained up the coast to San Simeon. NOAA also has four large weather buoys in the area, and these are serviced by the *George Cobb*. The USCG Aids to Navigation Team maintains aids to navigation light structures including Anacapa Light, Gull Island Light (off the south coast of Santa Cruz Island), and Southpoint Light on Santa Rosa Island. Gull Island and Southpoint Lights are accessed by USCG helicopters to land-servicing crews. The Aids to Navigation Team also has a 21-foot trailerable boat for aid servicing.

Other USCG units in California, such as Station Morro Bay, Marine Safety Office/Group Los Angeles-Long Beach, and Air Stations located in Los Angeles, San Diego, San Francisco, and Sacramento, transit and conduct training or actual search and rescue and law enforcement missions within the present CINMS boundary.

The USCG cooperates with several federal and state agencies, including but not limited to NMFS, the USFWS, the U.S. EPA, and the CDFG in carrying out its missions. The USCG performs marine mammal monitoring activities by reporting the location of marine mammals to NMFS during the execution of other mission activities.

3.5.11 Research and Education

3.5.11.1 Research

The CINMS is an important participant and collaborator in marine research. The Sanctuary's Sea Wolf aircraft, a former Air Force plane, is used to conduct monitoring as part of the Sanctuary Aerial Monitoring and Spatial Analysis (SAMSAP) program. The aircraft enables personnel to monitor activity and resources, survey Sanctuary users, conduct vessel traffic studies, observe the effects of shore runoff, perform aerial surveys during oil spill emergencies, and collect data on both marine mammals and the kelp forest. The aircraft can also be used for supervision and enforcement. Photography and video are used to record sightings. Special onboard equipment includes a Global Positioning System and laptop computer. Position information can be downloaded instantly to register the location of objects in sanctuary waters. Although NOAA has assigned the aircraft to both the CINMS and the Monterey Bay National Marine Sanctuary, the aircraft is primarily used within the CINMS.

The CINMS *R/V Shearwater* is the Sanctuary's new research vessel. Launched in 2003 this vessel is used primarily for research, and also serves as a host for educational field trips and emergency response in and around the Sanctuary. The *Shearwater* also includes wet and dry labs that allow on-board processing of samples and data. Extensive dive operations are supported by onboard facilities and equipment. The boat also has an A-frame and winch for oceanographic studies and observer stations for wildlife surveys. On board berthing, stowage, galley, and safety equipment allow for multi-day excursions with crews of up to ten scientists.

A summary of example research projects conducted in the Study Area follows:

- CalCOFI began publishing information on the ecology of the SCB in 1950 and continues to study the marine ecosystems of the SCB. Because of the research and data collection of CalCOFI investigators, the SCB is one of the most studied marine systems in the world.

- The Biological Resources Discipline of the USGS is conducting wide-ranging research on fishes of central and southern California.
- The Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) is a consortium of four universities (Oregon State University, University of California at Santa Cruz and Santa Barbara, and Stanford University) investigating the physical and biological processes of the nearshore region along Oregon and California coasts. Among the many projects of PISCO, one project seeks to determine how fish stocks in distant locales are connected.
- Several faculty and professional researchers at the University of California at Santa Barbara have received support from the National Science Foundation for a long-term study of the biological and physical links between marine and coastal processes of the region, such as the Long-Term Ecological Research (LTER) Program.
- Scientists from federal, state, and local government agencies, universities, and private and volunteer agencies have formed a Multi-Agency Rocky Intertidal Network to monitor important shoreline processes. This network includes 61 sites located from San Luis Obispo to San Diego Counties on the mainland and Channel Islands.
- In 1999, the Santa Barbara Museum of Natural History published a 14-volume taxonomic atlas of the benthic fauna of the Santa Maria Basin and the western Santa Barbara Channel.
- A number of investigators at the National Center for Ecological Analysis and Synthesis (NCEAS) in Santa Barbara, California, are studying the ecology of the Study Area.
- The University of California at San Diego's Scripps Institution of Oceanography continues to study coastal physical oceanography to help improve the ability to forecast changes in the coastal ocean and atmosphere.
- The National Biological Survey and CINP continue to create inventories and conduct monitoring programs on the ecology of the northern Channel Islands, such as: rocky intertidal ecological monitoring, marine debris monitoring, seabird monitoring, kelp forest monitoring, terrestrial vertebrate monitoring, water quality inventories, land bird monitoring, island fox monitoring, and terrestrial vegetation monitoring.
- The CINMS staff, in partnership with CDFG and University of California, Santa Barbara scientists, recently completed a research cruise using the Delta Submersible. The purpose of this project was to collect baseline data for the newly established Marine Reserves.
- Ice Age Study focuses on research on stacked delta deposits that fringe the southern margin of the Santa Barbara Channel.
- Plfeger Institute of Environmental Research (PIER) strives to ensure healthy, sustainable oceans for our future, to develop the public's understanding and appreciation for the ocean and its life, and to act as stewards of the marine environment. Scientists at the Plfeger Institute are conducting research on the movement of giant seabass in the CINMS.

- The Collaborative Marine Research Program involves commercial fisherman and their unique skills and expertise with the CINMS in the gathering of vital data on natural resources, biophysical processes, and effects of human activities in order help the Sanctuary staff make informed management decisions.
- The NOAA Environmental Services Data Directory is a forms-based tool that allows users to search for publicly available environmental data held by public and private sources throughout the world.

Other research and data collection supported by the CINMS include participation in annual ocean and coastal conferences and meetings, and assistance in biological surveys, including a current baseline population study on Xantus' murrelets.

Biological Monitoring Programs

A characterization of existing monitoring programs in the CINMS is depicted in *Summary of Research Programs in the Channel Islands National Marine Sanctuary* (Abeles *et al.* 2003). These monitoring programs are developed by various federal, state, and local organizations including the CDFG, NOAA's Southwest Fisheries Science Center, CINP, the University of California at Santa Barbara's Marine Science Institute, and a number of other scientific organizations. In addition, a list of study organisms and techniques is provided in the summary of monitoring programs.

A variety of economically and ecologically important species are studied, such as sea urchin, abalone, sea bass, rockfish, seabird, pinniped, and humpback and blue whale populations. Several programs monitor marine communities, defined simply as a group of different species that occupy a particular habitat. Research programs have been established to monitor communities on sandy beaches and lagoons, rocky intertidal habitats, kelp forests, subtidal rocky reefs, soft bottom habitats, and in the open ocean. Research programs that monitor community dynamics generally include surveys of common species that occur in a particular habitat. Research on the environment includes mapping physical habitats, measuring variables such as water temperature, salinity, and oxygen content, tracking ocean currents and winds, and remote sensing. Several research programs attempt to monitor ecosystem dynamics, including both physical and biological variables. Recent efforts within the CINMS have emphasized seabird research, archeological/cultural research (primarily shipwrecks), and collecting baseline data for emerging management issues.

Channel Islands National Park

There are also a number of research and monitoring activities at the CINP. For example, the USGS - Biological Resources Discipline/NPS Cooperative Research Activities are involved in monitoring and research activities. A list of related publications and technical reports from the NPS for the northern Channel Islands is available online at <http://www.nps.gov/chis/rm/HTMLPages/References.htm>. The Channel Islands Field Station has cooperative agreements with CINP and the University of California at Santa Barbara that facilitate collaboration between field station scientists and university and Park biologists. The linkage with the university also provides opportunities to supervise graduate students in marine ecology and work in laboratories with flow-through seawater to allow housing temperate marine species. CINP provides access to the habitats of several rare and endemic plant species suffering from the impacts of exotic weeds and feral animals. The CINP also has a wealth of marine resources in need of study and management. Field station biologists analyze data collected from the CINP and assist with its extensive resource monitoring program.

Scientists at the Channel Islands Field Station conduct research on the ecology and conservation biology of sensitive plants and animals at the Channel Islands and along California's coast. In doing so, the field station supports information needs of the NPS, USFWS, and other state and federal clients such as the Department of Defense, Sanctuary, and CDFG. Some examples of ongoing research in plant ecology include rare plant demography, effects of grazing by feral animals on native plant communities, restoration ecology, and the distribution of exotic weeds. Examples of research in marine ecology are restoration strategies for the nearly extirpated white abalone, patterns of disturbance for threatened western snowy plovers, Marine Reserve design, and kelp forest community dynamics.

CINP Marine Monitoring Program Reports are available online, including on the kelp forest monitoring program, seabird monitoring, rocky intertidal monitoring, and sandy beach monitoring (<http://www.nature.nps.gov/im/units/chis/HTMLpages/AnnlReports/MarineReports.htm>).

3.5.11.2 Education

The CINMS provides a variety of outreach and education programs for teachers, students, resource users, and the general public. Sanctuary education and outreach efforts are focused in two strategic areas: (1) community involvement, partnerships, and community program development through interactive programs (training programs, workshops, special events, school programs) and (2) product development (printed materials, website development, audio visual materials, signs, displays, and exhibits) as critical education and outreach tools.

While addressing site-specific education and outreach needs, the CINMS Education Program strives to fulfill the NMSP's national education plan by (1) providing educational leadership in marine conservation and protection efforts, (2) promoting the sanctuaries' identity with site-specific application of projects and products, and (3) establishing a standard of educational excellence to be upheld by all 13 National Marine Sanctuary sites.

Additional information on coastal and marine education programs in the region can be found at the *Marine and Coastal Educational Resources Directory*, which is available online at <http://www.coastal.ca.gov/publiced/directory/resdirectory/rdindex.html>.

Interpretative programs aim to enhance public awareness and understanding of the significance of the CINMS and the need to protect its resources. The management objectives designed to meet this goal are:

- Enhance public access to relevant information on the CINMS, its goals, and resources;
- Improve opportunities for a wider public access to the CINMS and first-hand appreciation of significant CINMS resources;
- Broaden public support for the CINMS and CINMS management by offering on-site and off-site programs suited to visitors of diverse interests, ages, and skills;
- Provide for public involvement by encouraging feedback on the effectiveness of interpretive programs, collaboration with CINMS management staff in extension/outreach programs, and participation in other volunteer programs; and
- Collaborate with other organizations to provide interpretive services complementary to the NMSP.

Educational activities that CINMS staff have developed include:

- Interpretive exhibits, signage, and displays;
- Publications including newsletters (*Alolkoy*), brochures, posters, and an educational resource directory;
- A cooperative agreement with the Santa Barbara Maritime Museum;
- Cooperative development of the Santa Barbara Outdoor Visitors Center with the NPS and the CDFG;
- Sustainable Seas Expedition Educational Curriculum;
- Education programs and curriculum for teachers and students;
- Public programs, lectures and events; and
- Internship and volunteer programs.

A sample of classroom materials and online educational activities that incorporate real data from research activities associated with the CINMS follows:

- *Shipwreck Database* is a online database that includes information on shipwrecks from each of the five West Coast National Marine Sanctuaries.
- *Marine Mammal Sightings Database* reports marine mammal sightings in the Santa Barbara Channel.
- *Nautical Charts* introduces students to marine navigation and the main components of a nautical chart using a local chart for Channel Islands waters.
- *Monitoring a Habitat* describes how marine biologists monitor marine habitats in the CINMS.
- *Partner Educational Activities* works collaboratively with a variety of regional and national partners to develop educational activities for teachers and students.
- *JASON XIV: From Shore to Sea* explores the terrestrial and marine ecosystems that extend from California's coast to the CINMS to learn how such systems affect life on our planet.
- *Mapping an Ocean Sanctuary* includes the CINMS, the Center for Image Processing in Education, and National Geographic Society's Sustainable Seas Expeditions to help teachers bring geographic information systems (GIS) into their classrooms. The Mapping an Ocean Sanctuary curriculum and four day training workshop use Arcview software to explore maps and databases showing biological, geological, and economic features of the CINMS. Some specific topics include environmental monitoring, distribution of marine species, marine reserves, and commercial and recreational use patterns in the CINMS.

- *The Sanctuary and Center for Image Processing in Education* partnered to develop a GIS marine science curriculum and middle and high school teacher training program. GIS is a valuable visualization tool used by marine resource managers to map locations of animals and to understand ocean bathymetry, currents, sea surface temperature and more.
- *Project Oceanography* is a live television program designed for middle school science students. Each week during the school year, students can learn about a variety of ocean science topics right in their classroom.
- *Student Field Monitoring* supports the development of student and teacher participation in long-term field monitoring studies.
- *University of California at Santa Barbara Marine Science Institute Oceans to Classrooms* is a collaborative effort with CINMS and area teachers on developing kits and lesson materials for bringing ocean sciences into the classrooms. There is a floating laboratory component that includes stations for collecting water chemistry, plankton data, marine mammal sightings, and learning about marine navigation.
- *Waves on Wheels Program* supports a curriculum linked to state and local science standards and provides important outreach in Santa Barbara County.
- *Marine Reserves Digital Lab* includes an interactive marine reserves simulation of collaborative decision-making and negotiation over the establishment of marine reserves within the CINMS.
- *National Geographic Society's Sustainable Seas Expeditions* is a joint project of the National Geographic Society and NOAA efforts to explore, conduct research and develop public education programs about the National Marine Sanctuaries.
- *Project Oceanography Channel Islands Curriculum* is a collaborative effort of the CINMS and Project Oceanography (during the winter of 2002) to create three live educational television programs and educational activity packets for 6th to 8th grades highlighting research in the CINMS, intertidal monitoring, and marine reserves.
- *Channel Islands Naturalist Corps (CINC)* was established in 2001 as the Sanctuary Naturalist Corps but was expanded in 2003 through a joint effort with CINP to jointly train volunteers to interpret both Park and Sanctuary resources. CINC includes a group of volunteer ocean stewards dedicated to educating passengers on board local marine excursion vessels conducting whale watch tours, natural history tours, and island trips in the Santa Barbara Channel in the CINP and Sanctuary. Members provide education about the unique marine life. CINC volunteers collect valuable research on marine mammals and other important resources. Over 90 community volunteers, representing students, working professionals, and the retired, participate in the program. They attend a 5-week training class on Sanctuary programs and the physical, biological, and geological aspects of the CINMS and CINP. CINC volunteers represent the Sanctuary and the NPS on over 600 whale watch trips, attend numerous local outreach events, and educate over 100,000 local residents, tourists, and school children annually.

- *Dive trips* sponsored by the CINMS are geared toward non-consumptive use of the resources, and focus on the following activities: (1) underwater photography workshops with local experts on board to provide hands-on instruction, (2) fish survey trips during the month of July for the Great Annual Fish Count, and (3) year round fish surveys.
- *Diver Uplink Cruises* are special cruises for non-divers that offer a diver-conducted video tour of the kelp forests and underwater reefs using state-of-the-art equipment for full two-way interaction between observers and the dive team.
- Each year the CINMS partners with other organizations to coordinate and host several *Teacher Workshops*. These workshops are single-day to multi-day professional development opportunities. During these workshops, teachers learn the importance and value of the CINMS and learn strategies for integrating ocean studies into all disciplines, participate in field investigations, interact with the research community, learn scientific monitoring techniques, develop lesson plans and refine presentation skills. CINMS also conducts teacher workshops at local, regional, and national professional conferences each year.
- *Mountains to the Sea Watershed Curriculum* includes a partnership between the CINMS and Santa Barbara County's Project Clean Water in the development of a comprehensive watershed education program for 4th through 8th grade that introduces both teachers and students to the local watersheds of the region. The curriculum, in-class presentations, field trips, and resources cover a variety of topics including the water cycle, runoff, and the connection between our local creeks and the ocean. A variety of handouts, posters, and experiments are also included.
- *The Santa Barbara Maritime Museum* is located in the Waterfront Center in the Santa Barbara Harbor. The Museum preserves and presents to the public the maritime history of California's Central Coast, while providing an ongoing educational platform to study and record human interaction with the marine environment. The CINMS and the Museum are developing five interactive exhibits featuring the shipwrecks at the Channel Islands. Sanctuary staff also participate in ongoing lecture series at the Museum.
- *Cabrillo High School Aquarium* is located on the campus of Cabrillo High School in the Lompoc Unified School District. High school students are active participants in the daily maintenance, operation, and outreach programs of the aquarium. The CINMS partners with the aquarium on exhibits, including a weather kiosk display and other educational programs.
- *Santa Barbara Museum of Natural History Sea Center*, located on Stearns Wharf in Santa Barbara, California, reopened in 2005 after extensive renovations. The Sea Center contains a hands-on immersion laboratory that highlights the work of scientists who explore, monitor, and discover ways to preserve our oceans. The CINMS is collaborating with the Sea Center on educational exhibits and programs.
- *Parks as Classrooms* is the education program of the NPS in partnership with the National Park Foundation. It encompasses many different kinds of experiential education programs. Each year Park rangers at CINP share the Park resources with over 10,000 students in classrooms and nearly again that many at the Park visitor center. In-class

programs cover a variety of natural and cultural history topics for grades 2 through 5 in local schools. Programs at the visitor center meet the needs of classes from preschool through university level. All programs are tied to the curriculum students are studying.

- *Channel Islands National Park Visitor Center* has several marine and Channel Islands related educational displays including a rocky tidepool, elephant seal exhibit, and pygmy mammoth exhibit. There is also a theatre, bookstore, and Channel Islands Information Center.
- *Discovering The Channel Islands National Marine Sanctuary* is an adult education course administered by Sanctuary staff and offered alternately by Ventura College Community Services and Santa Barbara City College. The course allows students to explore the diverse kelp forests, rocky reefs, and sandy bottom communities of the CINMS. This course includes weekly evening lectures and an optional field trip to the Channel Islands.
- Aboard the *McArthur*, the *Sanctuary Quest Expedition* team conducted research, exploration, and monitoring within and adjacent to the CINMS. Over the long term, the expedition may help to provide a framework for understanding more about the efficacy and role of the sanctuary system in protecting and conserving marine resources, and to provide the impetus for continued regional research.
- *Coastal Watersheds Education Program* is run by several agencies and non-profit organizations and supported by the Sanctuary. It includes web-based and classroom activities that integrate and interpret current research program data sets, teacher research and monitoring training programs, and involving students in local volunteer monitoring projects.
- *South Coast Watershed Research Center* is a newly opened learning and resource center to enhance public awareness of the Santa Barbara watershed system located at Arroyo Burro Beach. The Sanctuary provides the center with exhibits that tie coastal processes to offshore systems.
- *Channel Islands Harbor Boating Instruction and Safety Center* is supported by the Sanctuary. The Sanctuary helps design exhibits and other literature for this center.
- *Caltrans Adopt-a-Highway Program* is a program that includes removing litter, planting and establishing trees or wildflowers, removing graffiti, and controlling vegetation along the California's State Highway System. The Sanctuary participates to prevent pollutants from entering California's waterways.
- *California Coastal Commission Coastal Cleanup Day* is an annual, one-day event during which volunteers gather at designated beaches to collect and remove trash and debris from beaches. Sanctuary staff serve as site leaders and coordinate volunteer efforts.

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4 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

4.0 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

This chapter evaluates the environmental consequences of proposed changes to existing NMSA regulations for the Management Plan Update for the CINMS. The environmental impacts of the Proposed Action, Alternative 1, and No-Action Alternative are evaluated in Sections 4.1, 4.2, and 4.3, respectively. A total of 13 proposed regulatory updates or changes are discussed under the Proposed Action within this EIS; a total of 14 proposed regulatory updates or changes are discussed under Alternative 1. Also discussed below are changes to the description of the sanctuary boundary, Department of Defense exemption and requirements language, and CINMS permit procedures and issuance criteria.

Current conditions presented in Chapter 3.0 and conditions under the No-Action Alternative provide a baseline for analysis of the Proposed Action and Alternative 1. Impacts are defined in the following categories:

- Significant adverse impact;
- Significant adverse impact but mitigable to less than significant;
- Less than significant adverse impact;
- No impact; and
- Beneficial impact

To determine whether an impact is significant, CEQ regulations require the consideration of context and intensity of potential impacts (40 CFR 1508.27). Context normally refers to the setting, e.g., local or regional, and intensity refers to the severity of the impact. Impacts can either be direct or indirect, and short-term or long-term. Direct impacts are those caused by implementing the proposed activities that occur at the same time and place as the proposed activities. Indirect impacts are those caused by implementing the proposed activities, but the impacts occur later in time or are farther removed in distance from those activities.

Table 4.0-1 summarizes the environmental impacts associated with the Proposed Action. Text supporting these conclusions is presented below, and mitigation measures are listed for all significant impacts. Mitigation is the reduction or elimination of the severity of an impact. The intention of mitigation is to reduce the effects of an action on the environment.

NEPA, or related requirements, requires additional evaluation of the project's impacts with regards to:

- Significant unavoidable adverse impacts;
- The relationship between short-term uses and long-term productivity;
- Any irreversible or irretrievable commitment of resources (e.g., renewable resources such as wetlands or wildlife habitat);
- Environmental justice; and
- Growth-inducing impacts.

An EIS must describe any significant unavoidable impacts for which either no mitigation or only partial mitigation is feasible. NEPA requires that an EIS also consider the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity. Finally, NEPA requires that an EIS analyze the extent to which the proposed project's effects would involve irreversible or irretrievable commitments of renewable resources (e.g., wetlands, wildlife habitat). A discussion of each of these impacts is discussed in Section 4.4 below.

The socioeconomic impacts of the proposed project are discussed for each proposed regulatory changes, and then summarized in Section 4.5 below. Evaluating and comparing the potential socioeconomic impacts of each alternative involves assessing how implementing the proposed prohibitions would directly and indirectly affect user groups and/or industries, as well as the local economy. In conjunction with evaluating and comparing impacts on the physical, biological, and historical environments, this socioeconomic assessment is an important step in the process of selecting a preferred alternative.

CEQ regulations implementing NEPA also require that the cumulative impacts of a proposed action be assessed (40 CFR Parts 1500-1508). A cumulative impact is an "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions" (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over time. CEQ's guidance for considering cumulative effects states that NEPA documents "should compare the cumulative effects of multiple actions with appropriate national, regional, state, or community goals to determine whether the total effect is significant." Cumulative impacts are discussed in Section 4.6 below.

This EIS analyzes regulatory changes, not the action plans proposed in the DMP (Vol. 1). The DMP action plans describe non-regulatory management strategies and actions that Sanctuary staff would use to address various issues identified during the management plan review process. Nested within each action plan is a series of strategies, each of which contains detailed actions Sanctuary staff would take over the next five years in order to meet CINMS goals and objectives. These strategies comprise activities ranging from program planning, budgeting, administrative services, mapping, vessel and aircraft operations, to basic and applied research and monitoring activities, education and outreach services, and advisory body activities. Section 6.03(c)(3)(d) of NOAA Administrative Order 216-6 specifies that these and other administrative or routine program functions that have no potential for significant environmental impacts are eligible for a categorical exclusion. The NMSP has determined that the proposed actions within the DMP (Vol. I) individually and cumulatively will have no potential for significant impact on the environment and, therefore, qualify for a categorical exclusion from NEPA's requirement for conducting an environmental assessment or preparing an EIS. Thus, the DMP's planned activities are not included or analyzed within this DEIS.

4.1 PROPOSED ACTION

4.1.1 Prohibition 1 (Oil and Gas)

Proposed revisions to Prohibition 1 regarding oil and gas activities (15 CFR 922.71(a)(1)), would yield a regulation nearly identical to the existing regulation except that outdated language related to cleanup equipment requirements for potential oil spills would be deleted.

4.1.1.1 Effects on Physical, Biological and Historical Resources

Because the proposed revision to Prohibition 1 would not result in any physical effects on the environment, there would be no impacts on the physical or biological environment, or on historical resources within the Sanctuary.

4.1.1.2 Socioeconomic Effects

The proposed revisions to Prohibition 1 would not create any new requirements for the oil and gas industry, but rather would simply eliminate from the regulation the outdated and unnecessary spill response equipment requirements. Oil and gas operations would, however, continue to be required to adhere to current standards and follow current procedures for cleanup of oil spills as stipulated in CERCLA and other federal, state and local regulations, although this would not be stipulated by the Sanctuary's regulations. Therefore, implementation of revised Prohibition 1 would have no impact on offshore oil and gas operations. In addition, no other human uses would be affected by revisions to Prohibition 1.

Table 4.0-1 Summary of Impacts Under the Proposed Action

<p style="text-align: center;"><u>Legend</u></p> <ul style="list-style-type: none"> - No impact < Less than significant adverse impact > Significant adverse impact + Beneficial impact <p>Note: Proposed regulatory changes are summarized</p>	Physical Environment	Biological Environment	Cultural/Historical Resources	Human Use										
				Oil & Gas	Tele-communications	Minerals Mining	Vessels & Harbors	Commercial Fishing	Recreation & Tourism (consumptive and non-consumptive)	Marine Salvage Businesses	Motorized Personal Watercraft	Aviation	Research & Education	Department of Defense
<p>Prohibition 1 (modification): Exploring for, Developing, or Producing Hydrocarbons</p> <p>Remove outdated and unnecessary oil spill contingency equipment requirements for offshore oil industry operations at leased areas partially within the Sanctuary</p>	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<p>Prohibition 2 (new): Exploring for, Developing, or Producing Minerals</p>	+	+	+	-	-	<	-	+	+	-	-	-	+	-
<p>Prohibition 3 (modifications): Discharging or Depositing</p> <p>Specify that the existing exception for discharging or depositing fish, fish parts, or chumming materials (bait) applies only to lawful fishing activity within the Sanctuary</p> <p>Remove an exception for discharging or depositing meals on board vessels</p> <p>Clarify that discharges allowed from marine sanitation devices apply only to Type I and Type II marine sanitation devices</p> <p>Prohibit discharges and deposits of any material or other matter from beyond the boundary of the Sanctuary that subsequently enters the Sanctuary and injures a Sanctuary resource or quality</p>	-	+	-	-	-	-	-	-	<	-	-	-	<	-
	-	+	-	-	-	-	<	<	<	<	-	-	<	-
	+	+	-	-	-	-	<	<	<	<	-	-	<	-
	+	+	-	-	-	-	-	-	-	-	-	-	-	-

Legend	Physical Environment	Biological Environment	Cultural/Historical Resources	Human Use										
				Oil & Gas	Tele-communications	Minerals Mining	Vessels & Harbors	Commercial Fishing	Recreation & Tourism (consumptive and non-consumptive)	Marine Salvage Businesses	Motorized Personal Watercraft	Aviation	Research & Education	Department of Defense
<ul style="list-style-type: none"> - No impact < Less than significant adverse impact > Significant adverse impact + Beneficial impact <p>Note: Proposed regulatory changes are summarized</p>														
Prohibition 4 (modification): Altering the Seabed														
Extend from 2 NM to 6 NM from Islands the existing prohibition on alteration of the submerged lands of the Sanctuary	+	+	+	-	<	<	-	+	+	-	-	-	+	-
Prohibition 5 (new): Abandoning any structure, material or other matter on or in the submerged lands of the Sanctuary	+	+	+	-	-	-	<	+	+	+	-	-	+	-
Prohibition 6 (modification): Nearshore Operation of Vessels														
Prohibit vessels of 300 gross registered tons or more (excluding fishing and kelp harvesting vessels) from approaching within 1 NM of the Islands	+	+	+	-	-	-	-	+	<	-	-	-	<	-
Prohibition 7 (modification): Disturbing a Seabird or Marine Mammal by Aircraft Overflight – minor wording changes	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Prohibition 8 (modification): Moving, Removing, or Injuring a Historical Resource														
Revise and strengthen to prohibit “moving, possessing, injuring or attempting to move, remove, or injure any Sanctuary historical resource”	-	-	+	-	-	-	-	-	+	-	-	-	+	-
Prohibition 9 (new): Taking a Marine Mammal, Sea Turtle, or Seabird except as authorized under the Marine Mammal Protection Act, the Endangered Species Act, or the Migratory Bird Treaty Act	-	+	-	-	-	-	-	-	+	-	-	-	+	-

Legend	Physical Environment	Biological Environment	Cultural/Historical Resources	Human Use											
				Oil & Gas	Tele-communications	Minerals Mining	Vessels & Harbors	Commercial Fishing	Recreation & Tourism (consumptive and non-consumptive)	Marine Salvage Businesses	Motorized Personal Watercraft	Aviation	Research & Education	Department of Defense	
<ul style="list-style-type: none"> - No impact < Less than significant adverse impact > Significant adverse impact + Beneficial impact <p><u>Note: Proposed regulatory changes are summarized</u></p>															
Prohibition 10 (new): Possessing Marine Mammals, Sea Turtles, or Seabirds except as authorized under the Marine Mammal Protection Act, the Endangered Species Act, or the Migratory Bird Treaty Act	-	+	-	-	-	-	-	-	-	+	-	-	-	+	-
Prohibition 11 (new): Protection of Sanctuary Signs and Markers	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
Prohibition 12 (new): Releasing an Introduced Species within or into the Sanctuary	+	+	+	-	-	-	-	+	+	-	-	-	-	+	-
Prohibition 13 (new): Operation of Motorized Personal Watercraft within Channel Islands National Park	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-
Sanctuary Boundary Description and Coordinates Clarifications (modifications)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Exemptions and Requirements for Department of Defense Activities (modifications)	<	<	<	-	-	-	-	<	<	-	-	-	-	<	-
Permit Procedures and Issuance Criteria (modifications)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

4.1.2 Prohibition 2 (Mineral Activities)

4.1.2.1 Effects on Physical, Biological and Historical Resources

Implementation of Prohibition 2, a prohibition of exploration, development, or production of minerals in the Sanctuary, would protect the physical environment within the Sanctuary from potential negative effects on the seabed and water quality due to mineral mining, and therefore would have a direct long-term beneficial impact on the physical environment. Mineral extraction activities could involve scraping the Sanctuary's seabed surface and/or excavation of pits and tunnels into the seabed. In addition to the physical impacts on the seabed structure, mining could decrease water quality through the discharge of drill cuttings and mud. Discharge of drill cuttings and mud could also increase turbidity that could cause interference with the filtering, feeding, or respiratory functions of marine organisms. Drill cuttings and mud often have elevated concentrations of metals that can be toxic to marine life (e.g., arsenic, mercury). Other potential impacts could include: destruction and direct smothering of the benthic biota; potential harm to fisheries; loss of food sources and habitat for some species; possible lowered photosynthesis and oxygen levels; and degraded appearance of the water itself. Implementation of Prohibition 2 would therefore result in added protection of biological resources such as invertebrates and fishes that utilize benthic habitats and rely on high water quality in the Sanctuary. Implementation of Prohibition 2 also would protect against noise levels associated with mining that could have the potential to disturb seabirds, marine mammals or other organisms. Therefore, Prohibition 2 would result in a direct long-term beneficial impact to biological resources in the Sanctuary. Finally, prohibition of mining within the Sanctuary would reduce the risk of potential disturbance to underwater historical resources either through physical disturbance or increased turbidity, which would result in direct long-term beneficial impact to historical resources. Such protections would be consistent with the Sanctuary prohibition on alteration of or construction on the seabed.

4.1.2.2 Socioeconomic Effects

The proposed new Prohibition 2 would affect the potential for future mineral exploration, production, and development within the Sanctuary boundary to the extent that such activities could potentially have been conducted in compliance with other existing Sanctuary regulations (e.g., see Prohibitions 3 and 4). This activity has not occurred within the Sanctuary, and there is no known present or foreseeable future plan or project to conduct mineral exploration, production, or development within the Sanctuary boundary. Therefore, proposed new Prohibition 2 would have a less than significant adverse impact on this potential human use.

Because implementation of Prohibition 2 would help to protect biological and historical resources, it would have indirect long-term benefits on other human uses such as fishing, recreation, tourism, research, and education. No other human uses would be affected by implementation of Prohibition 2.

4.1.3 Prohibition 3 (Discharging or Depositing)

Prohibition 3 is proposed to remain largely the same as the existing discharge and deposit regulation, with some wording changes aimed at improving clarity of the regulation in a manner consistent with its original intent. There are, however, also some important substantive changes proposed.

- New language clarifying that discharging or depositing of fish, fish parts, or chumming materials (bait) is allowed only if it is from, and conducted during, lawful fishing activities in the Sanctuary;

- A new prohibition on discharging or depositing food waste from vessels; and
- A new prohibition on discharging or depositing any material or other matter outside the Sanctuary that subsequently enters and injures a Sanctuary resource or quality.
- A clarification that the Marine Sanitation Device (MSD) discharge exception from the Sanctuary's discharge prohibition specifically applies to Type I and Type II (U.S. Coast Guard classification) MSDs, and not to Type III MSDs.

Impacts associated with each of these changes are discussed below. The revised regulation would continue other aspects of the current discharge and deposit regulation.

4.1.3.1 Discharging or Depositing of Fish, Fish Parts, or Chumming Materials (Bait)

The new proposed language regarding this exception would specify that the existing regulatory provision that allows for the deposit of fish, fish parts or chumming materials (bait) applies only when such activity is associated with lawful fishing activity, and when such discharge/deposit occurs while conducting lawful fishing activity. This new language would specify that discharging or depositing fish, fish parts, or chumming material (bait) for non-fishing purposes is not allowed in the CINMS.

Effects on Physical, Biological, and Historical Resources

This new language would have a beneficial impact to biological resources of the Sanctuary by preventing discharge or depositing of fish, fish parts, or chumming material (bait) from activities other than fishing, such as dumping of waste fish product, and from fishing that did not occur in the Sanctuary. Such dumping of fish, fish parts, or chumming material could promote negative biological effects associated with fish feeding (e.g., providing unnatural food sources to marine life, altering community structure, and changing species behavior) and could lead to conflicts among uses (e.g., dumping of chum to attract sharks in close proximity to surfers or SCUBA divers). This new language would have no impact on the physical or historical resource environment.

Socioeconomic Effects

This new language would continue to have no impact on lawful fishing in the CINMS because it is complementary to fishing activities. This new language would have less than significant adverse impacts on recreational and research use in the CINMS, as chumming practices for purposes other than fishing (e.g., to attract marine life for research, photography or other recreational purposes) is not known to occur within the Sanctuary. Other uses of the Sanctuary would not be affected by this regulatory change.

4.1.3.2 Discharging or Depositing of Food Waste from Vessels

Addition of human food waste into the Sanctuary provides an artificial source of food and nutrients to fish and other species and can be disruptive to the nutrient cycle and food chain dynamics of the natural ecosystem. Artificial feeding may encourage the growth of fish and invertebrate populations that tolerate and often thrive on artificial food sources, and that sometimes can outcompete other species, thereby reducing overall species diversity in localized areas (Alevizon 2000).

Some commercial and recreational vessels that operate within the Sanctuary currently dispose of their food waste (or meals on board vessels) by dumping it into the ocean. However, vessels are currently restricted from discharging or depositing food waste within 3 NM of land and from discharging or

depositing food wastes unless ground to less than one inch within 3 to 12 NM of land by regulations implementing MARPOL (33 CFR, Part 151 et seq. and see Section 3.4.3.1 for more details). A proposed revised prohibition (Prohibition 3) would require that all vessels either dispose of their food waste as solid waste upon arrival at ports and harbors or properly discharge/deposit their food waste into the ocean beyond the Sanctuary's 6 NM boundary. Therefore, Prohibition 3 would have the effect of extending an absolute prohibition on discharge/deposit of food waste to the Sanctuary area between 3 and 6 NM from the Islands.

Effects on Physical, Biological and Historical Resources

Implementation of Prohibition 3 would have a long-term beneficial impact to biological resources within the Sanctuary by protecting the natural ecosystem from such disruption (the impacts of which are discussed above at 4.1.3.2). The physical environment and historical resources would not be affected by this regulation change.

Socioeconomic Effects

Potential effects on vessel-based commercial or recreational activities would be highest during multi-day trips to the islands or within the Sanctuary. Alternate disposal options for food waste, other than within the Sanctuary, are feasible and affordable. No health standards or hazards would be expected to be violated from retaining food waste on board until appropriate discharge/deposit outside the Sanctuary is possible or upon returning to port. Therefore, less than significant adverse impacts to vessel-based commercial, recreational, and research user groups would occur with implementation of revised Prohibition 3. Implementation of Prohibition 3 also would have indirect long-term benefits on other resource-dependent human uses such as fishing, recreation, tourism, research, and education by preventing disruptions to the nutrient cycle and food chain dynamics of the natural ecosystem.

4.1.3.3 Marine Sanitation Device Discharge/Deposit Exception Clarification

The proposed changes concerning the existing exception for vessel sewage discharge/deposit (biodegradable effluent) from a marine sanitation device provide greater clarity and specificity on the original intent of the regulation. Although the existing regulation requires that vessel wastes be "generated by marine sanitation devices" and this is meant to prohibit the discharge/deposit of untreated sewage into the Sanctuary, the proposed new language provides greater clarity with regard to this by specifying that such discharges/deposits are allowed only if generated by Type I or II marine sanitation devices. Type I and II marine sanitation devices treat wastes, while a Type III marine sanitation device does not.

Effects on Physical, Biological, and Historical Resources

This proposed change would produce a direct long-term beneficial impact to biological resources and the physical environment (water quality) of the Sanctuary, because, in being more clear, it would provide a more effective deterrent to illegal discharges/deposits of sewage into the Sanctuary, thus providing greater protection to these resources and qualities. Historical resources would receive no impact from this proposed regulatory change.

Socioeconomic Effects

The proposed modification to the Sanctuary's discharge/deposit regulation clarifying that discharges/deposits allowed from marine sanitation devices apply only to Type I and Type II marine

sanitation devices is applicable to all vessels operating in Sanctuary waters, but would not actually introduce any new restrictions. This change would clarify the original intent of the Sanctuary's discharge/deposit regulation, which is that raw sewage may not be discharged/deposited from vessels into the Sanctuary, but rather it must first be treated by a marine sanitation device. There is no quantitative data available on the extent of raw sewage discharge/deposit occurring from vessels into Sanctuary waters, but anecdotal information and direct observations of this practice by Sanctuary staff confirm that it does take place. To the extent that this clarification might affect customary though illegal sewage discharge/deposit practices of some vessel operators not using Type I or Type II marine sanitation devices, the effect on those activities is expected to be less than significant. The basis for this is that such discharges/deposits may still legally occur outside the Sanctuary's 6 NM boundary and vessel sewage may be pumped out and disposed of at mainland ports and harbors. In addition, commercial fishing, recreational and tourism use, and research and educational use may receive indirect benefits from this regulatory clarification, especially as it might pertain to preventing large volume discharges from larger vessels, since it may contribute to sustaining favorable environmental quality in their areas of operation.

4.1.3.4 Discharge or Deposit from beyond the Sanctuary

Currently, accidental or intentional discharge/deposit from beyond the Sanctuary boundary of oil, hazardous substances, or other matter from vessels, offshore facilities, or possibly mainland-based sources have the potential to enter and injure a Sanctuary resource or quality. This proposed revision to Prohibition 3 would prohibit the discharge or deposit of any material or other matter that enters the Sanctuary and injures Sanctuary resources or qualities, including oil, hazardous substances, or any other matter.

The NMSA defines "injure" as "to change adversely, either in the short or long-term, a chemical, biological or physical attribute of, or the viability of. This includes, but is not limited to, to cause the loss of or destroy" (15 CFR 922.3). "Sanctuary resource" is defined at 15 CFR 922.3 as "any living or non-living resource of a National Marine Sanctuary that contributes to the conservation, recreational, ecological, historical, research, educational, or aesthetic value of the Sanctuary, including, but not limited to, the substratum of the area of the Sanctuary, other submerged features and the surrounding seabed, carbonate rock, corals and other bottom formations, coralline algae and other marine plants and algae, marine invertebrates, brine-seep biota, phytoplankton, zooplankton, fish, seabirds, sea turtles and other marine reptiles, marine mammals and historical resources." "Sanctuary quality" is defined at 15 CFR 922.3 as "any of those ambient conditions, physical-chemical characteristics and natural processes, the maintenance of which is essential to the ecological health of the Sanctuary, including, but not limited to, water quality, sediment quality and air quality."

Adverse environmental effects may result from incidents originating outside CINMS, such as oil spills, that could introduce harmful substances into the Sanctuary that subsequently cause the injury of Sanctuary resources or qualities. Such incidents would need to be reviewed on a case-by-case basis in order to determine if a Sanctuary resource has been injured by a discharged/deposited substance, and to verify the source of that discharge/deposit.

Types of discharge/deposit that would be excepted from this proposed prohibition are the same as those excepted from the CINMS prohibition on discharges/deposits *within* the Sanctuary. These exceptions are:

- Fish, fish parts or chumming materials (bait) used in or resulting from lawful fishing activity beyond the boundary of the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity there;

- Biodegradable effluent incidental to vessel use and generated by an operable Type I or II marine sanitation device (U.S. Coast Guard classification) approved in accordance with section 312 of the Federal Water Pollution Control Act, as amended, (FWPCA), 33 U.S.C. sec. 1321 *et seq.* Vessel operators must lock all marine sanitation devices in a manner that prevents discharge of untreated sewage;
- Biodegradable matter from a vessel resulting from deck wash down, vessel engine cooling water, or graywater as defined by section 312 of the FWPCA;
- Vessel engine or generator exhaust;
- Effluents routinely and necessarily discharged or deposited incidental to hydrocarbon exploration, development or production allowed by CINMS regulations; and
- Discharges allowed under section 312(n) of the FWPCA for military vessels.

With this regulation, the activities that result in discharges or deposit outside the Sanctuary would not be directly regulated by the NMSP, but parties responsible for injuries to sanctuary resources or qualities resulting from such activities would be subject to penalty under the NMSA.

Discharge of oil or hazardous substances into the environment is regulated under CERCLA and the FWPCA (as amended by OPA). Under CERCLA, the FWPCA, and section 312 of the NMSA, natural resource trustees, such as NOAA, may seek to recover damages caused by injury to natural resources within the Sanctuary due to direct or indirect discharges of oil and hazardous substances into the Sanctuary. The discharge of fill and dredged material is also regulated under the FWPCA. Implementation of the proposed revised Prohibition 3 would prohibit via regulation subject to civil penalties the discharge or depositing of any matter that causes injury to Sanctuary resources or qualities.

Adding this prohibition to the CINMS regulations would not only provide greater protection for Sanctuary resources and qualities, but would also increase the level of regulatory consistency among national marine sanctuaries. This same prohibition is found in the regulations for several other sanctuaries designated more recently than CINMS. These sites include the Monterey Bay National Marine Sanctuary, Flower Garden Banks National Marine Sanctuary, Stellwagen Bank National Marine Sanctuary, Olympic Coast National Marine Sanctuary, and Florida Keys National Marine Sanctuary.

Effects on Physical, Biological, and Historical Resources

Prohibition 3 would have a direct long-term beneficial impact on biological resources and the physical environment (water quality), because it would act as an additional deterrent of illegal discharge/deposit and subsequent injury to Sanctuary resources or qualities and would also address additional discharges/deposits if they cause injury. This regulation would not affect historical resources.

Socioeconomic Effects

This proposed regulation would except measurable discharges/deposits likely to come from vessels, including: fish, fish parts or chumming materials (bait) used while conducting lawful fishing activity; biodegradable effluent incidental to vessel use and generated by an operable Type I or II marine sanitation device (U.S. Coast Guard classification) approved in accordance with section 312 of the Federal Water Pollution Control Act (33 U.S.C. sec. 1321 *et seq.*); biodegradable matter from a vessel resulting from deck wash down, vessel engine cooling water, or graywater as defined by section 312 of the FWPCA; and

vessel engine or generator exhaust. Other discharges/deposits would only be illegal under this regulation if it could be proved they both entered the Sanctuary and injured Sanctuary resources or qualities. As such, this regulation would have a less than significant adverse impact on vessels, commercial fishing, recreation and tourism, marine salvage, and research and educational human uses adjacent to the CINMS.

4.1.4 Prohibition 4 (Altering the Seabed)

The proposed revised Prohibition 4, which addresses alteration of the seabed, would be similar to the existing regulation except (1) it would expand seabed protection beyond 2 NM off the Islands out to the full extent of the 6 NM CINMS boundary and (2) it would replace the term “seabed” with “submerged lands” to attain consistency with the NMSA. The proposed revised Prohibition 4 would affect the potential for future human uses that might entail alteration of submerged lands beyond 2 NM of the Islands within the CINMS that are not already allowed under Sanctuary regulations (i.e., exploring for, developing, or producing hydrocarbons within the Sanctuary pursuant to leases executed prior to March 30, 1981, and laying of pipeline pursuant to exploring for, developing, or producing hydrocarbons). There is no present activity or known foreseeable future plan or project to alter the submerged lands within the CINMS boundary from 2 to 6 NM offshore, other than oil and gas industry activities already exempted from Sanctuary regulations (see Prohibition 1). Certain activities with the potential to impact the submerged lands of the Sanctuary could be allowed pursuant to a CINMS permit as authorized under the existing regulation (e.g., modification of CINP piers, appropriate research projects, etc.). Exceptions to this regulation would remain unchanged with one exception, and consist of the following:

- anchoring a vessel;
- installing an authorized navigational aid;
- conducting lawful fishing activity;
- laying pipeline pursuant to exploring for, developing or producing hydrocarbons; and
- exploring for, developing or producing hydrocarbons as allowed by Prohibition 1.

The third exception is proposed to be changed from “bottom trawling from a commercial fishing vessel” because not just bottom trawling but also other types of lawful fishing, e.g., pot and trap fishing, could alter the submerged lands.

Effects on Physical, Biological, and Historical Resources

Implementation of Prohibition 4 would protect the physical environment within the CINMS from potential negative effects of alterations on the seabed, island reefs, and water quality, and would therefore have a long-term beneficial impact on the physical environment. In addition to the physical impacts on the seabed or reef structure, some activities that alter submerged lands (e.g., drilling operations) can decrease water quality by increasing turbidity. Therefore, implementation of Prohibition 4 also would result in protection of biological resources such as invertebrates and fishes in the CINMS that utilize the seabed or reef as substrate and rely on high water quality. This would result in a long-term beneficial impact to biological resources. Finally, prohibiting alteration of submerged lands within the CINMS would reduce the risk of potential disturbance to underwater historical resources either through physical disturbance or increased turbidity, thereby having a long-term beneficial impact on historical resources.

Socioeconomic Effects

Because implementation of Prohibition 4 would result in a beneficial impact on physical, biological, and historical resources, it would also provide indirect long-term benefits to resource-dependent human uses such as fishing, recreation, tourism, research, and education. Protection of the seabed will protect benthic habitats that play an important role in the ecosystem, which in turn may provide indirect benefits to ecosystem dependent human uses such as those listed above. This prohibition would not negatively impact lawful commercial and recreational fishing activities since lawful fishing activity is excepted from this prohibition.

Prohibition 4 would have a less than significant adverse impact on potential human uses that may involve alteration of submerged lands within the Sanctuary, as no such activities are not known to be proposed for installation or development within the Sanctuary at this time or in the foreseeable future. Other existing human uses, which do not normally involve, depend upon, or result in alteration of the submerged lands of the Sanctuary, would not be adversely affected by this regulation. Marine salvage operators when engaged in vessel salvage recovery operations would not be adversely affected by this proposed regulation because the operator may apply for a salvage permit. For those entities that do occasionally need to temporarily place materials on the submerged lands of the Sanctuary, such as research entities, the Sanctuary permitting process could be used to potentially allow acceptable activities.

4.1.5 Prohibition 5 (Abandoning)

The proposed new Prohibition 5 would prohibit abandoning any structure, material, or other matter on or in the submerged lands of the CINMS.

4.1.5.1 Effects on Physical, Biological and Historical Resources

This new regulation would protect against abandonment of shipwrecks or other debris. Implementation of Prohibition 5 would protect the physical environment within the CINMS from potential negative effects on the seabed, reefs, and water quality due to abandonment of destructive or potentially polluted matter. It would, therefore, have direct long-term beneficial impact on the physical environment. In addition to the physical impacts on the seabed, abandonment of structures or other matter increases solid waste within the CINMS and could decrease water quality due to leaching of hazardous materials, depending upon the nature of the debris, and increase physical damage and stress on habitats due to smothering and abrasion. Therefore, implementation of Prohibition 5 also would result in protection of biological resources such as invertebrates and fishes in the CINMS that use benthic habitats and/or rely on high water quality. In addition, prohibiting abandonment of matter within the CINMS would reduce the risk of potential disturbance to underwater historical resources through physical disturbance, and would therefore result in a direct long-term beneficial impact to historical resources.

4.1.5.2 Socioeconomic Effects

The NMSP knows of no present activity or foreseeable future plan or project that would result in the expected abandonment of a structure or any other matter within the CINMS boundary. Therefore, Prohibition 5 would have a less than significant adverse impact on human uses within the Sanctuary that require abandonment of structures or other matter.

Protection of the natural habitats within the Sanctuary, free from abandoned wreckage or other debris, can enhance conditions for recreational and commercial users of the Sanctuary, such as those engaged in diving or lawful fishing (especially bottom fishing and trawling operations) or for those engaged in

research of and education about natural marine environments. As such, fishing, recreation and tourism, research and education would experience an indirect long-term beneficial impact from this proposed regulation. In addition, marine salvage businesses engaged in removing wrecked vessels, thus assisting boaters with compliance of Sanctuary regulations, would experience a beneficial impact from this proposed regulation. Other Sanctuary users are expected to experience no impact from this proposed regulation.

4.1.6 Prohibition 6 (Nearshore Operation of Vessels)

Revised Prohibition 6 would expand the Sanctuary's existing vessel regulation, which prohibits cargo carrying vessels and vessels engaged in the trade of servicing offshore installation from within 1 NM of Island shores, by proposing to also apply this prohibition to vessels of 300 gross registered tons or more. This proposed revision prohibits large vessels from coming within close proximity of an Island. An accident involving a large vessel has the potential to cause much greater damage to reefs or other nearshore Sanctuary habitats than an accident involving a smaller vessel. In addition, louder and lower frequency noise levels often are associated with larger vessels and may disturb marine mammals and seabirds on or near the Islands.

Existing exceptions to the vessel operation prohibition would remain in effect, and are the following:

- transporting persons or supplies to or from an Island;
- fishing vessels and kelp harvesting vessels.

4.1.6.1 Effects on Physical, Biological, and Historical Resources

This revised regulation would provide additional protection against grounding accidents of large vessels on the Islands and collisions and potential noise impacts on marine mammals and seabirds. Implementation of Prohibition 6 would protect the physical environment within the CINMS from potential negative effects of accidents on nearshore habitats, and would have a direct long-term beneficial impact on the physical environment. Therefore, implementation of Prohibition 6 also would result in protection of biological resources such as invertebrates and fishes in the CINMS that use the seabed or reef as habitat, seabirds that use Island cliffs and shores, and marine mammals that use beaches, and thus would have a direct long-term beneficial impact on the biological environment. Finally, the proposed additional protection against grounding accidents with large vessels would reduce the risk of potential disturbance to underwater historical resources through physical disturbance and would thus have a direct long-term beneficial impact on historical resources.

4.1.6.2 Socioeconomic Effects

Currently, no known commercial passenger or recreational vessels over 300 gross registered tons approach within 1 NM of the Islands within CINMS. Many cruise ships are larger than 300 gross registered tons, and would be reached by this prohibition, but cruise ships have not been seen within the nearshore waters of the Sanctuary for more than ten years and the NMSP is not aware of any routes close to the Channel Islands planned by the cruise line industry. In addition, access inside of 1 NM from the Islands would be allowed for smaller craft that may be stowed on large vessels located beyond 1 NM (such as Zodiaks or skiffs). Therefore, this regulation would have no impact on current recreational or tourism use but could have less than significant negative affects on potential future uses of the CINMS by some large vessels.

It is unlikely that a marine salvage vessel would ever be large enough to be affected by this prohibition, and in any case the operators of such vessels could apply for a permit. Fishing and kelp-harvesting vessels would remain excepted, as they are under the current regulation. For these reasons, there is no impact expected for the above mentioned uses. However, research vessels of the >300 gross registered ton size class needing to transit within 1 NM of the Islands (an uncommon--less than once per year--but anticipated occurrence) would need to apply for and receive a permit from CINMS, the adverse impact of which is expected to be less than significant.

According to the *Port of Long Beach Master Plan* (POA of Long Beach 2003), the Port Authority plans to expand capacity of the harbor, which will increase both the number and size of vessels that use the Santa Barbara Channel (see Chapter 3.0 for more details). It is reasonable to expect that travel by vessels greater than 300 gross registered tons within the CINMS is a foreseeable future activity, although that activity is expected to remain within the Santa Barbara Channel's vessel traffic separation scheme that passes through the eastern portion of CINMS (and is beyond 1 NM from Island shores) or transit well outside the Channel Islands. As such, Prohibition 6 would have no negative impact on use of the CINMS by large vessel traffic (shipping activity) and associated ports and harbors.

Because implementation of Prohibition 6 would benefit biological and historical resources, it would also have an indirect long-term beneficial impact to other human uses such as fishing, recreation, tourism, research, and education. These uses may benefit from a nearshore marine environment that is not subjected to large-scale vessel groundings, hazardous spills, and/or wildlife disturbance risks that very large vessels can pose. No other existing human uses would be affected by implementation of Prohibition 6.

4.1.7 Prohibition 7 (Disturbing a Seabird or Marine Mammal by Aircraft Overflight)

Revised Prohibition 7—prohibiting disturbance of marine mammals and seabirds from aircraft overflights below 1000 feet within 1 NM of Island shores—would remain essentially identical to the existing regulation except for minor wording changes (see Table 2.1-1) which specify that exceptions to this regulation do not override the obligation to comply with proposed Prohibition 9 (taking a marine mammal, seabird or sea turtle).

4.1.7.1 Effects on Physical, Biological and Historical Resources

The proposed wording changes to this existing regulation would provide no adverse impact on the physical, biological, or historical environment.

4.1.7.2 Socioeconomic Effects

The proposed wording changes to this existing regulation would provide no adverse impact on any of the human uses within the Sanctuary.

4.1.8 Prohibition 8 (Moving, Removing, or Injuring a Sanctuary Historical Resource)

The Sanctuary's existing historical resource protection regulation prohibits "removing or damaging any historical or cultural resource." Revised Prohibition 8 would be very similar to the existing regulation except for: (1) minor wording changes that have no effect on the environment or on human uses; and (2) expanding the range of prohibited actions to include "moving," "injuring" (deleting "damaging") or "possessing," and "attempting to move, remove, injure, or possess" a Sanctuary historical resource.

4.1.8.1 Effects on Physical, Biological, and Historical Resources

By increasing the specificity of prohibited actions, and adding possession and attempts, this revised regulation would become more enforceable and otherwise provide additional protection to Sanctuary historical resources. Revised Prohibition 8, therefore, would have a direct long-term beneficial impact on CINMS historical resources. Added enforceability would serve as an additional deterrent to illegal activities with historical resources in the CINMS. This revised regulation would not affect the physical or biological environment within the CINMS.

4.1.8.2 Socioeconomic Effects

Because removing or damaging a historical resource is prohibited within the Sanctuary, this revised regulation would have no adverse impact on human uses of the CINMS. The added enforceability of this revised prohibition would have an indirect long-term beneficial impact on human uses such as recreation, tourism, research, and education by helping to preserve these resources and leaving them intact for their heritage, educational, and scientific values as well as enjoyment by the general public.

4.1.9 Prohibition 9 (Taking a Marine Mammal, Sea Turtle, or Seabird)

Prohibition 9 is a proposed new Sanctuary regulation that would prohibit the take of any marine mammal, sea turtle, or seabird within or above the Sanctuary except as expressly authorized by the MMPA, ESA, or MBTA. This revised regulation would provide additional protection to marine mammals, sea turtles, and seabirds beyond what is currently afforded.

Per the NMSA regulations, “take or “taking” is defined as follows: (1) for any marine mammal, sea turtle, or seabird listed as either endangered or threatened pursuant to the ESA, to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect or injure, or to attempt to engage in any such conduct; (2) for any other marine mammal, sea turtle, or seabird, to harass, hunt, capture, kill, collect or injure, or to attempt to engage in any such conduct. For the purposes of both (1) and (2) of this definition, this includes, but is not limited to, collecting any dead or injured marine mammal, sea turtle, or seabird, or any part thereof; restraining or detaining any marine mammal, sea turtle, or seabird, or any part thereof, no matter how temporarily; tagging any sea turtle, marine mammal, or seabird; operating a vessel or aircraft or any other act that results in the disturbance or molestation of any marine mammal, sea turtle, or seabird (15 CFR 922.3).

This proposed new regulation would not apply if an activity that might cause take of marine mammals, seabirds, or sea turtles has already been expressly authorized under the MMPA, ESA, or MBTA (e.g., federal- or state-approved fisheries with authorization under those acts). This new regulation would bring a special focus to protection of the diverse and abundant marine mammal and sea bird populations of the Sanctuary as well as the occasional sea turtles present within the CINMS. This regulation, with its focus on protecting populations within the CINMS, is complementary to the jurisdiction and efforts of other resource protection agencies (i.e., NMFS, USFWS, CDFG), as these other authorities must spread limited resources over much wider geographic areas than the CINMS. In addition, this proposed regulation would provide a greater deterrent per the civil penalties in the NMSA, thus assisting in increasing compliance with laws that provide protection to marine mammals, seabirds and sea turtles. This same regulation has been in place at national marine sanctuaries established at Monterey Bay, Stellwagen Bank, Olympic Coast, and the Florida Keys.

Additional exceptions to this proposed Sanctuary “take” prohibition would allow for activities to occur that are:

- necessary to respond to an emergency threatening life, property, or the environment;
- necessary for valid law enforcement activities;
- exempted Department of Defense activities (see Table 2.1-1).

With this proposed regulation, if NMFS or the USFWS issues a permit for the take of a marine mammal, seabird, or sea turtle, it would not be regulated by the NMSP and therefore would not require a permit from the Sanctuary unless the activity would also violate another Sanctuary regulation.

4.1.9.1 Effects on Physical, Biological and Historical Resources

This new regulation would have a direct long-term beneficial impact on biological resources. This regulation would not affect the physical or historical environment within the CINMS.

4.1.9.2 Socioeconomic Effects

Because take of most of these species is already illegal except when expressly authorized by the MMPA, ESA, MBTA, this regulation would have no significant adverse impact on human uses of the CINMS. Because the Sanctuary would not need to authorize take under a CINMS permit for activities permitted pursuant to the MMPA, ESA, or MBTA, this regulation would not impact the permit processes of other agencies (e.g., USFWS, NMFS, CDFG, etc.). In addition, commercial fishing or certain research activities which may involve the occasional take of these species may lawfully operate as such under authorizations granted pursuant to the MMPA, ESA, or MBTA. Further strengthening the prohibition of unpermitted, illegal activities that cause take of these species would have an indirect long-term beneficial impact on human uses such as recreation, tourism, research, and education. For example, the added protection of marine mammals, seabirds, and sea turtles can complement business activities focused on whale watching, kayaking, or other marine excursion tours within the Sanctuary.

4.1.10 Prohibition 10 (Possessing Marine Mammals, Sea Turtles, or Seabirds)

Related to proposed new Prohibition 9, this regulation would prohibit possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as expressly authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA. This revised regulation would provide added protection to these species beyond what is currently afforded.

This proposed new regulation would not apply if an activity involves possession of a marine mammal, seabird, or sea turtle the take of which has already been expressly authorized under the MMPA, ESA, or MBTA (e.g., federal- or state-approved fisheries with authorization under those acts). Like proposed Prohibition 9, this new regulation would bring a special focus to protection of the diverse and abundant marine mammal and sea bird populations and the sea turtles of the CINMS. This Sanctuary-focused regulation providing protection to these important species is complimentary to the jurisdiction and efforts of other resource protection agencies (i.e., NMFS, USFWS, CDFG), as these other authorities must spread limited resources over much wider geographic areas than the CINMS. In addition, this proposed regulation would provide a greater deterrent per the civil penalties in the NMSA, thus assisting in increasing compliance with laws that provide protection to marine mammals, seabirds and sea turtles. A similar prohibition has been in place at national marine sanctuaries established at Monterey Bay, Stellwagen Bank, Olympic Coast, and the Florida Keys.

Exceptions to this proposed Sanctuary “possession” prohibition would allow for activities to occur:

- except as in accordance with the scope, purpose, terms and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR sec. 922.48 and 922.73;
- except for an activity necessary to respond to an emergency threatening life or the environment;
- except for an activity necessary for valid law enforcement purposes in the Sanctuary.

With this proposed regulation, if NMFS or the USFWS issues a permit for the possession of a marine mammal, seabird, or sea turtle, it would not be regulated by the NMSP and therefore would not require a permit from the Sanctuary unless the activity would also violate another Sanctuary regulation.

4.1.10.1 Effects on Physical, Biological and Historical Resources

Like Prohibition 9, this proposed regulation would have a direct long-term beneficial impact on biological resources. This revised regulation would not affect the physical environment or historical resources within the CINMS.

4.1.10.2 Socioeconomic Effects

Because take of these resources is already illegal except when expressly authorized by the MMPA, ESA, or MBTA, this regulation would have no adverse impact on human uses of the CINMS. Because the Sanctuary would not need to authorize possession under a CINMS permit for activities permitted pursuant to the MMPA, ESA, or MBTA, this regulation would not impact the permit processes of other agencies (e.g., USFWS, NMFS, CDFG). As under Prohibition 9, further strengthening the prohibition of unpermitted, illegal activities involving possession of these species would have an indirect long-term beneficial effect on human uses such as recreation, tourism, research, and education.

4.1.11 Prohibition 11 (Tampering with Signs)

Prohibition 11 is a proposed new Sanctuary regulation that would prohibit tampering with signs, notices, placards, monuments, stakes, posts, or boundary markers within the CINMS. This proposed regulation is consistent with regulations adopted for some other national marine sanctuaries. Addition of this regulation would serve as an additional deterrent to violation of the NMSA and its regulations.

4.1.11.1 Effects on Physical, Biological, and Historical Resources

This revised regulation would help to enhance protection and enjoyment of the Sanctuary’s physical environment, biological, and historical resources—in addition to what is currently afforded—by making it illegal to tamper with CINMS signs, monuments, and other markers that are necessary to adequately manage all of the resources and uses within the Sanctuary. As such, this proposed regulation would have an indirect long-term beneficial effect on these resources.

4.1.11.2 Socioeconomic Effects

Existing human uses of the Sanctuary and its facilities neither involve nor are likely to result in damage to Sanctuary signs. As such, this regulation would have no impact on human uses of the CINMS.

4.1.12 Prohibition 12 (Introducing or otherwise releasing an Introduced Species)

Prohibition 12, a proposed new regulation, would prohibit introducing or otherwise releasing from within or into the Sanctuary an introduced species, except striped bass (*Roccus saxatilis*) released during catch and release fishing activity. "Introduced species" is defined to mean: (1) species (including but not limited to any of its biological matter capable of propagation) that are non-native to the ecosystem(s) protected by the Sanctuary; or (2) any organism into which genetic matter from another species has been transferred in order that the host organism acquires the genetic traits of the transferred genes. In general, introduced species in the marine environment can threaten the diversity and/or abundance of native marine species, may hamper the ecosystem's ability to support itself, and therefore can adversely impact recreational and commercial activities. This proposed prohibition would help to prevent injury to Sanctuary resources, to protect the biodiversity of the CINMS ecosystems, and to preserve the native functional aspects of the ecosystems.

Introduced species could be introduced and become established in the CINMS from, for example, the release of live bait into the ocean, exchange of ballast water containing introduced species, or if introduced species attach themselves to vessels and subsequently are released within the Sanctuary or release offspring or viable reproductive material into the Sanctuary. For example, DeRivera et al. (2005) identified 16 non-native sessile invertebrates in the Channel Islands region that were originally introduced elsewhere on the west coast through vectors including shipping (hull-fouling), fisheries (accidental introduction via oysters), and ballast water. Release of live bait to the ocean within 3 NM is regulated strictly by the California Fish and Game Commission and CDFG. Implementation of Prohibition 12 would provide an added deterrent and support enforcement of state regulations already in place to prevent release of introduced species to the marine environment, and would extend these protections from the state waters portion of the Sanctuary (0-3 NM) to the outer boundary at approximately 6 NM from Island shores.

The exception for striped bass released during catch and release fishing activity is not anticipated to have an effect on physical, biological and historical resources. Striped bass were introduced to California in 1897 and are managed by the state under the Striped Bass Management Conservation Plan, which considers potential effects of striped bass on other species. (Leet *et al.* 2001)

This proposed regulation would help prevent unintentional introductions and intentional introductions of introduced species. This proposed regulation is based on a comparable prohibition in place at the Florida Keys National Marine Sanctuary. The Sanctuary staff would keep watch for and be prepared to act on introduced species sightings or elevated risks within or near the Sanctuary (see the Emerging Issues Action Plan in the Draft Management Plan, Vol. I.).

4.1.12.1 Effects on Physical, Biological, and Historical Resources

Implementation of Prohibition 12 would provide added protection to the marine ecosystems from the threat of introduced species introduction, consistent with Executive Order 13112 and other applicable federal and state laws (see also Sec. 5.0). A discussion of the numerous types of adverse impacts that introduced species can have on native coastal marine species is presented at Section 3.5.5. Therefore, Prohibition 12 would have a direct long-term beneficial impact on Sanctuary resources and qualities.

4.1.12.2 Socioeconomic Effects

The release of introduced species is not part of the expected business or operational practices associated with any of current human uses of the Sanctuary. Furthermore, projects involving use or release of

introduced species are not currently proposed within the CINMS, and none are anticipated within the foreseeable future. Therefore, a less than significant adverse impact on foreseeable future human uses of the CINMS would be expected by implementation of Prohibition 12. Implementation of Prohibition 12 is not expected to affect current fishing or boating within the CINMS and as such there would be no adverse impact to these current human uses. This proposed prohibition acknowledges that striped bass are the focus of an established state-managed sport fishery and since they consequently may be caught within the Sanctuary an exception is proposed for striped bass released during catch and release fishing activity. The proposed prohibition would therefore have no impact on the striped bass sport fishery, and supporting businesses, in California.

Prohibition 12 would also have a direct long-term beneficial impact on resource-dependent human uses of the Sanctuary (fishing, recreation, tourism, research, and education) by helping to protect and maintain its native resources and qualities.

4.1.13 Prohibition 13 (Operation of Motorized Personal Watercraft)

Prohibition 13 is a proposed new regulation that would prohibit operation of motorized personal watercrafts (MPWCs) within waters of the Channel Islands National Park, established by 16 U.S.C. sec. 410(ff). Operation of MPWCs within waters of the CINP is already prohibited by the NPS, due to the potential noise impacts on marine mammals and seabirds and potential impacts on water and air quality (36 CFR 3.24).

For purposes of this proposed new regulation, the definition of “motorized personal watercraft” is the same as that provided by the National Park Service (NPS). The NPS definition at 36 CFR 1.4(a) is “a vessel, usually less than 16 feet in length, which uses an inboard, internal combustion engine powering a water jet pump as its primary source of propulsion. The vessel is intended to be operated by a person or persons sitting, standing or kneeling on the vessel, rather than within the confines of the hull. The length is measured from end to end over the deck excluding sheer, meaning a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline. Bow sprits, bumpkins, rudders, outboard motor brackets, and similar fittings or attachments, are not included in the measurement. Length is stated in feet and inches.”

In combination with the existing NPS ban, this proposed CINMS regulation would provide added deterrence for purposes of ensuring protection of wildlife and habitats within the Sanctuary and Park.

The noise, air, and water quality pollution generated by MPWCs, as well as the nearshore operation of MPWC, may adversely impact the living marine resources within the CINMS through direct disturbances as well as environmental degradation. MPWCs operate in a manner unique among recreational vehicles and pose a threat to wildlife. Their shallow draft enables them to penetrate areas not available to conventional motorized watercraft (NPS 2000, MOCZM 2002). The high speed and maneuverability of MPWCs, along with the tendency to operate them near the shore and in a repeated fashion within a confined area, results in recurring disturbance to animals and habitats (Rodgers and Smith 1997, Snow 1989). Studies have shown that the use of MPWCs in nearshore areas can increase flushing rates, reduce nesting success of certain bird species, impact spawning fish, and reduce fishing success (Burger 1998, Snow 1989). The NPS (2000, 2004) identified several of these impacts along with interruption of normal activity, avoidance and displacement, loss of habitat use, interference with movement, direct mortality, interference with courtship, alteration of behavior, change in community structure, elevated noise levels, and damage to aquatic vegetation. Further, offshore marine mammals or surfacing birds may be unaware of the presence of these vehicles due to their low frequency sound; when the inability to detect the

vehicles is combined with their high speed and rapid and unpredictable movements, both animals and operators are at risk (Snow 1989).

Water quality concerns related to use of MPWC, and in particular those with two-stroke engines, include discharge of oil and gas, and air pollutants. MPWC using two-stroke engines may discharge as much as 25 percent of their gas and oil emissions directly into the water (NPS 2000). Two-stroke engines may also expel lubricating oil as part of their exhaust, and emit air pollutants such as volatile organic compounds, nitrogen oxides, particulate matter, and carbon monoxide (NPS 2004).

A review of information currently available from MPWC manufacturers indicates that they have made efforts to reduce emissions and noise through use of more efficient four-stroke engines as well as other technology (e.g., Bombardier Recreational Products, Inc. 2005a, 2005b; Personal Watercraft Industry Association 2005). However, it is not clear whether such improvements have rendered emission and noise impacts due to motorized personal watercraft insignificant. While industry sponsored studies indicate that MPWCs are no louder than similar motorized vessels under analogous conditions, other studies indicate that because MPWCs travel repeatedly in the same area, continually leaving and reentering the water, they create rapid cycles of noise that disturb humans and wildlife (MOCZM 2002). Industry improvements in noise and other emissions do not address impacts associated with the high speed, maneuverability, shallow draft and nearshore operation of motorized personal watercraft.

In addition to the types of impacts described above, NOAA's review of MPWCs at the Gulf of the Farallones National Marine Sanctuary also identified several other issues pertaining to MPWC:

- MPWCs have been operated in such a manner as to create a safety hazard to other nearby resource users.
- MPWCs may interfere with marine commercial users.
- MPWCs may disturb natural quiet and aesthetic appreciation.
- MPWCs have interfered with other marine recreational uses.

4.1.13.1 Effects on Physical, Biological, and Historical Resources

As indicated above, this proposed new MPWC regulation would provide added deterrence for purposes of ensuring protection to the Sanctuary's biological resources and habitats. This would provide a direct long-term beneficial impact to these resources, and cause no impact to historical resources.

4.1.13.2 Socioeconomic Effects

Because this activity is already illegal (36 CFR Part 3 sec. 3.24), this regulation would have no adverse impact on human uses of the Sanctuary. The proposed Sanctuary regulation would provide an additional deterrent to this currently illegal activity.

Further strengthening the prohibition of illegal activities within the CINMS would have an indirect long-term beneficial impact on human uses such as fishing, recreation, tourism, research, and education by helping preserve and maintain biological resources and habitats within the Sanctuary.

4.1.14 Sanctuary Boundary Description Clarification

Clarification of the legal description of the Sanctuary boundary is proposed (see Sec. 2.1.1 and Table 2.1-1). Changes proposed would specify that the submerged lands (i.e., the lands underlying the waters of the Sanctuary) are part of the CINMS boundary. There would be no practical change resulting from this revision because the Sanctuary has administered protective measures for the submerged lands since designation in 1980. The NMSP has authority to include submerged lands as part of national marine sanctuaries and this is reflected in amendments to the NMSA passed in 1984 (16 U.S.C. 1432(3)). This change would thus clarify the CINMS boundary description.

The Sanctuary's outer boundary coordinates and description of the shoreline boundary demarcation are also proposed for technical corrections and clarification. Specifically, the boundary description is proposed to be amended to clearly state that the shoreline boundary is the Mean High Water Line (MHWL) of Island shores. In addition, the list of latitude/longitude coordinates for the outer boundary at approximately six NM from Island shores is proposed to be updated with more accurate information, using the North American Datum of 1983. These technical changes would not significantly affect the actual size of the Sanctuary.

Since designation the area of CINMS has been described as approximately 1252.5 square nautical miles. However, adjusting for technical corrections and using updated technologies, the CINMS area is now calculated as approximately 1243 square nautical miles. The legal description of CINMS is proposed to be updated to reflect this change (see Sec. 2.1.1). This update would not constitute a change in the geographic area of the Sanctuary but rather an improvement in the estimate of its size.

4.1.14.1 Effects on Physical, Biological, and Historical Resources

The proposed boundary description changes and technical corrections to boundary coordinates would have no effect on the physical, biological, or historical environment of the Sanctuary.

4.1.14.2 Socioeconomic Effects

The proposed boundary description changes and technical corrections to boundary coordinates would have no adverse impact on human uses of the Sanctuary.

4.1.15 Department of Defense Activities

The revised language regarding the exemption of Department of Defense (DOD) activities (see Table 2.1-1) from Prohibitions 3 through 13 is more protective of the physical, biological, and historical environments than the original regulation, with the addition of clause (3), which requires that the DOD restore or replace any injured or destroyed Sanctuary resource or quality and mitigate damage, and clause (4), which requires that all DOD activities be carried out in a manner that avoids to the maximum extent practicable any adverse impacts on Sanctuary resources and qualities. This proposed revised regulation would continue to allow most DOD activities within the CINMS.

4.1.15.1 Effects on Physical, Biological and Historical Resources

The exemption language within this proposed revised regulation has the potential to impact the physical environment, biological environment, and historical resources by allowing the continuation of current DOD activities in the CINMS. Many of the military activities conducted today are different than those when the last management plan was developed for the CINMS (1982). The variety of military activities

discussed in Section 3.4.9 potentially have noise impacts (including sonic boom impacts) on Sanctuary wildlife; physical impacts on habitats in the Sanctuary that can cause the destruction or loss of plants, invertebrates, fish, or wildlife; and physical impacts on the seabed, water quality, or air quality. These impacts potentially have indirect impacts on fishing, recreation, tourism, research, and education. However, many of these DOD activities are no longer conducted within the boundary of the CINMS, or only rarely take place within the Sanctuary (see sec. 3.4.9). In addition, all of the military activities discussed in Section 3.4.9 are required to undergo an environmental impact evaluation under the NEPA process—in addition to many permit processes. Furthermore, as explained above, DOD must restore or replace injured or destroyed Sanctuary resources or qualities. Therefore, the DOD regulation would have a less than significant adverse impact on the physical environment, biological environment, and historical resources of the Sanctuary.

4.1.15.2 Socioeconomic Effects

The exemption language within this proposed revised regulation has the potential to impact some resource-dependent uses of the Sanctuary (fishing, recreation, tourism, research and education) by allowing the continuation of pre-existing DOD activities in the CINMS. However, many of these DOD activities are no longer conducted within the boundary of the CINMS, or only rarely take place within the Sanctuary (see Sec. 3.4.9). In addition, all of the military activities discussed in Section 3.4.9 are required to undergo an environmental impact evaluation under the NEPA process—in addition to many permit processes. Therefore, the DOD regulation would have a less than significant adverse impact on fishing, recreation, tourism, research, and educational uses of the Sanctuary. This proposed revised regulation would introduce no added adverse impact on the DOD activities because it retains exemptions for pre-existing military activities and specifies consultation and impact mitigation requirements and the like in a manner consistent with existing requirements in the NMSA. Proposed revised DOD regulation language would not affect other human uses in the Sanctuary.

4.1.16 Regulation on Permit Procedures and Issuance Criteria

The proposed revised permit regulations would maintain the status quo scope of activities for which a permit may potentially be issued (research, education, and salvage), and also add one more such activity category (for activities that will assist in managing the Sanctuary), in effect slightly broadening the types of otherwise prohibited activities for which a permit may be granted. To clarify what information the permit applicant must provide in his/her application the revised permit regulations indicate that in addition to the information listed in 15 CFR 922.48(b), all permit applications must include information the Director of the National Marine Sanctuary Program needs to make the required findings described in 15 CFR 922.73(b) and (c).

The need for this type of information is already implied in the status quo permitting regulation, which tells the Director to evaluate such matters when determining whether to grant a permit. In similar fashion, the proposed revised permit regulations clarify other concepts implicit in the status quo regulation, clarify existing requirements for permit applications found in the Office of Management and Budget approved applicant guidelines (OMB Control Number 0648-0141), and further refine current requirements and procedures from general National Marine Sanctuary Program regulations (15 CFR 922.48(a) and (c)). The intent of these clarifications and refinements is to make the permit regulations easier to comply with and enforce, while maintaining the same basic requirements of the permittee.

4.1.16.1 Effects on Physical, Biological, and Historical Resources

The revised language regarding the procedures and criteria for issuing a CINMS permit for an otherwise prohibited activity strengthens the language in the current regulation, thereby providing more protection to the physical, biological, and historical environments (See Section 2.1.17 and Table 2.1-1). Specifically, criteria were added that must be met to ensure protection of the resources (e.g., the proposed activity must have, at most, only short-term and negligible adverse effects on Sanctuary resources and qualities). These revised permit procedures and issuance criteria would have a direct long-term beneficial impact on these resources.

In addition, it is important to note that proposed activities that would require issuance of a Sanctuary permit also undergo a case-by-case NEPA review to ensure that in addition to Sanctuary permitting criteria, NEPA standards and process, as appropriate, are adhered to for assessing and analyzing potential environmental impacts.

4.1.16.2 Socioeconomic Effects

The revised language is of the same general nature as the language in the current regulation. The revised language would have no adverse impact on human uses in the Sanctuary that require a Sanctuary permit and would be expected to cause no effect on other uses.

4.2 ALTERNATIVE 1

Alternative 1 would be identical to the regulations and impacts described for the Proposed Action, with the exception of the slightly more stringent wording and restrictions described below:

4.2.1 Prohibition 3 (Discharging or Depositing)

Prohibition 3 (Discharging or Depositing) under Alternative 1 would exclude any vessel of 300 gross registered tons or more from discharging or depositing treated sewage waste within the CINMS.

4.2.1.1 Effects on Physical, Biological, and Historical Resources

Prohibition 3 under Alternative 1 would have a direct long-term beneficial impact on biological resources and the physical environment (water quality) because it would prevent large-quantity discharges/deposits of treated sewage, which could adversely affect Sanctuary resources and qualities. This regulation would not affect historical resources.

4.2.1.2 Socioeconomic Effects

Prohibition 3 under Alternative 1 would provide an additional protection to the Sanctuary's water quality by preventing large-volume discharges/deposits of treated sewage wastes (untreated discharges are already prohibited). However, less than significant adverse impacts to large vessel operators would be expected from this vessel restriction because: 1) the presence of such vessels inside CINMS is not common (with the exception of the brief duration that large ships pass through the section of the vessel traffic separation scheme that partially overlaps the eastern edge of the Sanctuary); 2) such discharges/deposits of untreated sewage are already prohibited in the state waters portion of the Sanctuary (from 0-3 NM from shore); and 3) moving beyond the 6 NM Sanctuary boundary before discharging is not expected to be infeasible for such large vessels but may potentially yield minimal additional costs, for

example, fuel and time costs. This regulation would have no adverse impact on other human uses of the CINMS.

4.2.2 Prohibition 6 (Nearshore Operation of Vessels)

Prohibition 6 (Nearshore Operation of Vessels) under Alternative 1 would exclude any vessel of 150 gross registered tons or more from operating within 1 NM of any Island within the CINMS. This would decrease the proposed upper vessel size limit from 300 gross tons (Proposed Action) to 150 gross tons (Alternative 1), thus potentially applying to a greater number of vessels and, as such, further reducing the number and risk of vessel groundings or collisions in sensitive nearshore areas.

As with the Proposed Action, existing exceptions to the CINMS vessel transit prohibition would remain in effect with this alternative, and include the following:

- transporting persons or supplies to or from an Island; and
- fishing and kelp-harvesting vessels (including those used for kelp harvesting).

4.2.2.1 Effects on Physical, Biological, and Historical Resources

Like the proposed action, this revised regulation would provide additional protection against collision and grounding accidents of large vessels on or near the Islands and potential noise impacts to marine mammals and seabirds. Implementation of this regulation would protect the physical environment within the CINMS from potential negative effects of accidents on nearshore habitats, and would have a direct long-term benefit on the physical environment. Therefore, implementation of this regulation would also result in protection of biological resources such as invertebrates and fishes in the CINMS that use the seabed or reef as habitat, seabirds that use Island cliffs and shores, and marine mammals that use beaches, and thus would have a direct long-term beneficial impact on the biological environment. Finally, the proposed additional protection against grounding accidents with large vessels would reduce the risk of potential disturbance to underwater historical resources through physical disturbance and would thus have a direct long-term beneficial impact on historical resources.

4.2.2.2 Socioeconomic Effects

Currently, no known commercial passenger or recreational vessels over 150 gross registered tons approach within 1 NM of the Islands within CINMS. Research vessels of that size class would be required to obtain a permit from CINMS, while fishing and kelp-harvesting vessels would remain exempt. Therefore, this regulation would have no impact on current human use but could affect potential future use of the CINMS by some larger vessels.

This restriction would be expected to have no impacts on human uses since there are currently no known vessels of 150 gross registered tons or greater using the CINMS waters within 1 NM. However, this regulation would be more restrictive to future uses than the Proposed Action. This regulatory change would preclude the potential for large non-cargo vessels to use the CINMS waters within 1 NM. This change, if implemented, would be expected to have greater future beneficial impacts on the physical environment, biological environment, historical resources, recreation, tourism, research, and education than the Proposed Action by protecting the Sanctuary from groundings of large vessels or other accidents.

4.2.3 Prohibition 15 (Lightering)

Prohibition 15 would prohibit lightering (at-sea transfer of petroleum-based products from vessel to vessel) within the CINMS.

4.2.3.1 Effects on Physical, Biological and Historical Resources

This prohibition would help protect Sanctuary resources and qualities from the adverse effects of spillage that may occur during non-emergency lightering operations. This new regulation would provide added protection to the Sanctuary's physical and biological resources by making it illegal to lighter within the CINMS. Although spills have occurred infrequently during lightering (see Section 3.4.1.4), this would eliminate the potential risk of a spill during lightering in the CINMS (except under emergency lightering conditions). As such, this regulation would provide a long-term beneficial impact to the physical and biological resources of the Sanctuary. This regulation would also not affect the historical environment within the CINMS.

4.2.3.2 Socioeconomic Effects

Currently, there are no designated lightering zones within the CINMS, and no otherwise approved lightering activities have taken place within CINMS or are planned to occur. Prohibiting lightering within the CINMS would subsequently have an indirect beneficial impact on human uses such as fishing, recreation, tourism, research, and education in the long-term by preserving and maintaining physical and biological resources within the Sanctuary. Because this activity is currently not being conducted in the CINMS unless in an emergency (which is exempt from this prohibition), this regulation would have no adverse impact on other human uses of the CINMS.

4.3 NO-ACTION ALTERNATIVE

The No-Action Alternative would not update or otherwise change any of the existing regulations for the Sanctuary. All of the existing Sanctuary regulations would remain as they are currently written. This alternative would not allow the NMSP to regulate certain activities that pose a threat to Sanctuary resources, as identified during the public and internal review processes. In addition, with the No-Action Alternative, some outdated information would remain in place for CINMS regulations (e.g., technical description of the boundary, obsolete oil spill cleanup equipment requirements). Therefore, implementation of the No-Action Alternative would be expected to, at best, maintain the status quo environmental condition of the Sanctuary. It is expected, however, that over time the No-Action Alternative would result in adverse impacts to Sanctuary resources and qualities because current management issues as identified during public scoping would not be addressed by Sanctuary management.

Specific impacts resulting from the no action alternative are described below.

4.3.1 Oil and Gas Exploration, Development, and Production

If the outdated portion of the status quo oil and gas regulation remains in place (i.e., the outdated cleanup equipment requirements and standards), it would render that part of the regulation meaningless because other laws and requirements now supercede the Sanctuary regulation's stated standards. While the utility of that portion of the regulation is diminished to a point of uselessness, it also would contribute to potential continued public confusion about what current spill preparedness requirements actually are. However, this outdated language by itself would not actually cause any impacts to the physical, biological

or historical environment of the Sanctuary, and would not cause any adverse socioeconomic impact on users of the Sanctuary.

4.3.2 Exploring for, Developing, or Producing Minerals

If the proposed new prohibition on exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to authorized hydrocarbon production, were not adopted, the Sanctuary could be left vulnerable to the impacts of future minerals mining activities. The potential biological and physical resource impacts of such activities could include: physical impacts on the seabed structure; reductions in water quality through the discharge of drill cuttings and mud; increases in turbidity that could cause interference with the filtering, feeding, or respiratory functions of marine organisms; potential introduction of elevated concentrations of metals (e.g., arsenic, mercury) that can be toxic to marine life; destruction and direct smothering of the benthic biota; loss of food sources and habitat for some species; possible lowered photosynthesis and oxygen levels; and degraded appearance of the water itself. The no action alternative could therefore potentially leave the Sanctuary open to possible significant adverse impacts to the biological and physical environment of the Sanctuary should in the future such activities be proposed and legally approved within CINMS. Similarly, adverse socioeconomic impacts could include degraded fishing conditions due to habitat and water quality impairment, as well as a potential diminishing of aesthetic qualities (i.e., water quality, noise) within the Sanctuary.

4.3.3 Discharging or Depositing Material or Matter

The potential impacts of the no action alternative with regard to the discharge and deposit of material and matter are described below for each of four issues dealt with in the proposed regulatory action: 1) use of marine sanitation devices; 2) fish, fish parts and chumming; 3) food waste from vessels; and 4) discharge or deposit from beyond the Sanctuary.

4.3.3.1 Discharging or Depositing of Fish, Fish Parts, or Chumming Materials (Bait)

Without adoption of the proposed modification to the discharge/deposit regulation specifying that the exception for discharging or depositing fish, fish parts, or chumming materials (bait) applies only to lawful fishing activities within the Sanctuary, the Sanctuary would likely experience such discharge/deposits and could see an increase in this practice if boater visitation rises along with regional population growth. As a result, the no action alternative would leave the Sanctuary open to potential adverse impacts to the biological environment known to be associated with fish feeding (e.g., providing unnatural food sources to marine life, altering community structure, and changing species behavior) and could also experience adverse socioeconomic effects such as possible conflicts among users (e.g., discharge/deposit of chum to attract sharks in close proximity to surfers or SCUBA divers).

4.3.3.2 Discharging or Depositing of Food Waste from Vessels

Without adoption of the proposed modification to the discharge/deposit regulation specifying that the exception will be removed which currently allows for discharging or depositing food wastes within or into the Sanctuary, the Sanctuary would likely experience such discharge/deposits and could see an increase in this practice if boater visitation rises along with regional population growth. As a result, the no action alternative would leave the Sanctuary open to potential adverse impacts to the biological environment known to be associated with the artificial feeding of marine life, including disruptions to the nutrient cycle and food chain dynamics of the natural ecosystem, a possible increase in fish and invertebrate populations that tolerate and/or may come to thrive on artificial food sources, and a potential

increase in fish and invertebrate populations that can sometimes outcompete other species, thereby reducing overall species diversity in localized areas (Alevizon 2000). Those potential biological impacts could correspond to adverse socioeconomic impacts on human activities within the Sanctuary, such as fishing, recreation, tourism, research, and education, all of which benefit from a healthy natural ecosystem left unimpaired by disruptions to the nutrient cycle and food chain dynamics that can be triggered by food wastes and the introduction of artificial food sources.

4.3.3.3 Marine Sanitation Device Discharge/Deposit Exception Clarification

Without adoption of the proposed modification to the discharge/deposit regulation exception clarifying that discharges allowed from marine sanitation devices (MSDs) apply only to Type I and Type II MSDs, the Sanctuary would likely continue to experience vessel discharges of raw sewage from some boaters who do not understand that Type III MSDs may not legally be discharged in the federal waters portion of CINMS (from 3-6 NM). In other words, maintaining the regulation as it is currently written allows for potential continued confusion with some boaters not understanding the intent of the existing Sanctuary regulation and as a result engaging in raw sewage discharge into Sanctuary waters. The status quo no action alternative therefore continues to leave the Sanctuary exposed to risks posed by raw sewage discharge practices. Such practices could contribute to adverse effects on the physical environment (i.e., degraded water quality) and biological resources (i.e., cumulative pollutant effects on the health of marine life). Adverse socioeconomic impacts on certain uses of the Sanctuary could include both degraded water quality conditions for commercial and recreational fishing and aesthetic impacts affecting recreational (e.g., diving) and tourism use, especially as it might pertain to large volume sewage discharges from larger vessels.

4.3.3.4 Discharge or Deposit from beyond the Sanctuary

Without adoption of the proposed modification to the discharge/deposit regulation prohibiting discharges and deposits of any material or other matter from beyond the boundary of the Sanctuary that subsequently enter the Sanctuary and injure a Sanctuary resource or quality, the Sanctuary could experience associated adverse impacts to its biological and physical environment. In addition, without a legal deterrent the Sanctuary would be less able to influence proposed projects outside the boundary that hold strong potential to cause such discharge/deposit injuries to CINMS resources or qualities. Therefore, depending on the type of incident, the potential adverse impacts to the Sanctuary environment could include impairment of water quality from spills or other harmful discharges or harmful toxic, suffocating or entanglement effects on marine life. In addition, those types of biological and physical impacts could also adversely affect human uses of the Sanctuary, including commercial and recreational fishing, recreational activities, and research and education activities.

4.3.4 Altering the Seabed

Without adoption of the proposed modification to the existing seabed alteration regulation to extent protection from 0-2 NM from the Islands to the entire CINMS, the Sanctuary could experience adverse impacts to its biological and physical environment within the 2-6 NM area. The severity of such impacts would depend on the nature and location of the activity altering the submerged lands but might generally be expected to cause physical damage to benthic habitats, introduce possible impairment to localized water quality (e.g., increased turbidity from drilling operations) that could in turn harm certain fish or benthic invertebrates, and possible damage submerged cultural and historic resources. Socioeconomic adverse impacts from the no action alternative could include the possible introduction of new deepwater obstructions to bottom-tending fishing gear, and the potential loss of opportunity or quality of experience associated with deepwater research of submerged cultural/historic resources.

4.3.5 Abandoning any Structure, Material, or Other Matter on or in the Submerged Lands

Without adoption of the proposed new regulation prohibiting abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary, the Sanctuary could experience adverse impacts to its biological, physical and historic resources. The severity of such impacts would depend on the nature and location of the activity leading to abandonment and the material or other matter being abandoned. For example, under the no action alternative a large shipwreck containing hazardous cargo potentially could be abandoned on the submerged lands, thus causing a range of physical impacts (destruction of benthic habitat), biological impacts (possible toxic contamination of marine life), impacts to historical resources (damage to existing submerged cultural or historical resource sites), and socioeconomic impacts (impaired fishing conditions, loss of trawling area, dangerous diving hazard, etc.).

4.3.6 Operation of Vessels within 1 NM of Islands

Without adoption of the proposed modification to the existing vessel operation regulation such that the scope is expanded to also prohibit any vessels of 300 gross registered tons or more (while continuing to except fishing vessels, kelp harvest vessels, and vessels transporting supplies to or from an Island) from operating within 1 NM of Island shores, the Sanctuary could experience adverse impacts to its nearshore biological, physical and historic resources.

Large vessels (> 300 gross registered tons) not already explicitly prohibited from operating within 1 NM of the Islands could include, for example, a cruise ship. Although cruise lines are not currently using the nearshore waters of the Sanctuary as a planned destination, such an activity could potentially occur in the future and pose similar grounding risks to Sanctuary resources. The existing regulation, prohibiting vessels carrying cargo, including, but not limited to, tankers and other bulk carriers and barges, or vessels engaged in the trade of servicing offshore installations, would not apply to cruise ships or other types of large vessels. The no action alternative would therefore leave the Sanctuary vulnerable to potential adverse impacts on the physical environment (e.g., reef scarring and habitat destruction from a large vessel grounding), possible adverse impacts to the biological environment (e.g., harm to marine life and seabirds from spilled hazardous substances), and corresponding possible adverse socioeconomic impacts to human uses such as fishing, recreation, tourism, research, and education that would be potentially displaced or impaired by a large-scale vessel grounding, nearshore hazardous spill, and/or associated disturbances to wildlife.

4.3.7 Disturbing a Seabird or Marine Mammal by Aircraft Overflight

Without adoption of the proposed minor modification to the existing regulation prohibiting disturbance of a seabird or marine mammal by flying a motorized aircraft at less than 1,000 feet over the waters within 1 NM of any Island, except to engage in kelp bed surveys or to transport persons or supplies to or from an Island, there would be little or no direct additional impact on the physical, biological, historical, or socioeconomic environment of the Sanctuary. Although the no action alternative would result in this regulation lacking an important clarification explaining that exceptions to this regulation do not override the obligation to comply with proposed Prohibition 9 (taking a marine mammal, seabird, or sea turtle), the status quo regulation would continue to provide the same protection to seabirds and marine mammals as provided by the status quo regulation.

4.3.8 Moving, Removing, Possessing, or Injuring a Sanctuary Historical Resource

Without adoption of the proposed modification to the existing regulation prohibiting moving, removing, or injuring a Sanctuary historical resource, the Sanctuary's submerged cultural and historic resources would be vulnerable to acts not expressly prohibited such as "possessing," "attempting to move," or "attempting to remove" these resources. As such, the no action alternative could result in an adverse impact on historic resources, as well as an adverse socioeconomic impact on recreational users who appreciate visiting or learning about these fragile resources and researchers attempting to study and interpret these sites.

4.3.9 Taking or Possessing a Marine Mammal, Sea Turtle, or Seabird

Without adoption of the proposed new regulation prohibiting taking any marine mammal, sea turtle or seabird in or above the Sanctuary, except as expressly authorized by the Marine Mammal Protection Act, as amended, (MMPA), 16 U.S.C. sec. 1361 et seq., Endangered Species Act, as amended, (ESA), 16 U.S.C. sec. 1531 et seq., Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. sec. 703 et seq., or any regulation, as amended, promulgated under the MMPA, ESA or MBTA, these Sanctuary resources would remain protected but not to the extent possible with this Sanctuary regulation in place. The proposed regulation is intended to afford special protection for and civil penalty deterrence from take of the abundant marine mammal and seabird populations found in the CINMS, as well as special protection for sea turtles occasionally found within the Sanctuary. Thus, the no action alternative would not directly pose a serious risk of adverse impact to these species, but some adverse biological impacts could be possible if appropriate administration and enforcement of the ESA, MMPA and MBTA were not maintained within the CINMS. In addition, adverse socioeconomic impacts associated with the no action alternative would be possible for users dependent upon continued protection of these species within the Sanctuary (e.g., recreation, tourism, research and education), but only under a possible but not expected scenario of unsatisfactory administration and enforcement of the ESA, MMPA, and MBTA within CINMS.

Similarly, without adoption of the proposed new regulation prohibiting possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as expressly authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA, these Sanctuary resources would remain protected but not to the extent possible with this Sanctuary regulation in place. The proposed regulation is intended to afford special protection for and civil penalty deterrence from possession of the abundant marine mammal and seabird populations found in the CINMS, as well as special protection for sea turtles occasionally found within the Sanctuary. Thus, the no action alternative would not directly pose a serious risk of adverse impact to these species, but some adverse biological impacts could be possible if appropriate administration and enforcement of the ESA, MMPA and MBTA were not maintained within the CINMS. In addition, adverse socioeconomic impacts associated with the no action alternative would be possible for users dependent upon continued protection of these species within the Sanctuary (e.g., recreation, tourism, research and education), but only under a possible but not expected scenario of unsatisfactory administration and enforcement of the ESA, MMPA, and MBTA within CINMS.

4.3.10 Tampering with Sanctuary Signs

Without adoption of the proposed new regulation prohibiting marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post or other boundary marker related to the Sanctuary, there would be no expected adverse impact to the biological or historical resources of the sanctuary. To the extent that the physical

environment of the Sanctuary includes signage, the no action alternative could potentially result in adverse impacts from vandalism, theft, or other damage to these signs and markers because there would not be a legal deterrence mechanism as would be provided by the proposed prohibition. If such damages did occur to Sanctuary signs, there could be some temporary minor socioeconomic impact to any users of the Sanctuary dependent upon or interested in learning from the Sanctuary's signage or markers.

4.3.11 Releasing an Introduced Species

Without adoption of the proposed new regulation prohibiting introducing or otherwise releasing an introduced species from within or into the Sanctuary, except striped bass (*Roccus saxatilis*) released during catch and release fishing activity, the Sanctuary environment would be at additional risk of adverse biological impacts from such introductions. Although other laws and regulations establish federal programs to help prevent introduced species introductions via ballast water, and although spawning, incubating or cultivating transgenic and exotic species is prohibited in California marine waters (Fish and Game Code sec. 15007), existing rules do not afford prohibitions against non-transgenic introduced species introductions in state waters, and against any form of introduced species introductions in federal waters of the CINMS. As such, under the no action alternative the Sanctuary would remain vulnerable to introductions that might otherwise be prevented using the legal civil penalty deterrence of the NMSA. Resulting biological impacts are numerous, and presented at Section 3.5.5. Possible socioeconomic impacts associated with the release of introduced species within the Sanctuary are numerous as well, and include such impacts as altering or degrading commercial and recreational fisheries, altering habitat and species assemblages in a manner that degrades non-consumptive recreational or tourism activities such as diving or wildlife viewing, and compromise research and education activities.

4.3.12 Operation of Motorized Personal Watercraft

Without adoption of the proposed new regulation prohibiting the operation of motorized personal watercraft within waters of the Channel Islands National Park, the Sanctuary would still remain legally protected from the adverse impacts of these craft but not to the extent possible with the proposed Sanctuary regulation in place. The intent of this proposed Sanctuary regulation is to augment the Park's enforcement capabilities by providing additional and stronger legal deterrence from higher NMSA penalties levied through an administrative (civil) rather than a criminal process. Thus, the no action alternative would not directly increase adverse impacts to Sanctuary resources and qualities from the MPWC use (see section 4.1.13 for details on those possible impacts), but some adverse biological impacts could be possible if appropriate administration and enforcement of the National Park Service ban within CINP were not maintained. In addition, some adverse socioeconomic impacts associated with the no action alternative would be possible for users dependent upon protection of wildlife that MPWC might disturb or aesthetic conditions that MPWC might disrupt (e.g., recreation, tourism, research and education), but only under a possible but not expected scenario of unsatisfactory administration and enforcement of the National Park Service ban within CINP.

4.3.13 Department of Defense Activities

Without adoption of the proposed modification of the existing regulation pertaining to Department of Defense (DOD) activities, the Sanctuary would be providing DOD an exemption to other CINMS regulations for military operations based on an out-of-date (1982) list of activities. In addition, a no action alternative would mean the current DOD regulation would not be expressly consistent with the NMSA, which has been reauthorized several times since the DOD regulation went into effect (1982). The proposed regulation would require that all DOD activities be carried out in a manner that avoids to the maximum extent practicable any adverse impacts on Sanctuary resources and qualities, and would also

require that in the event of destruction of, loss of, or injury to a Sanctuary resource or quality resulting from an incident, including, but not limited to, discharges, deposits, and groundings, caused by a DOD activity, DOD, in coordination with the NMSP Director, must promptly prevent and mitigate further damage and must restore or replace the Sanctuary resource or quality in a manner approved by the NMSP Director. Because these safeguards to Sanctuary resources and qualities would not be part of the no action alternative, the no action alternative would continue to expose the Sanctuary environment to possible adverse impacts to biological, physical, and historical resources that might be caused by military operations.

4.3.14 Permit Procedures and Issuance Criteria

Without adoption of proposed modifications to the existing permit procedure regulation, the Sanctuary would continue to operate with regulations that do not provide a clear mechanism to guide issuance of permits for activities that would further Sanctuary management. Although the no action alternative would therefore not provide the additional clarity desired and needed, it is not expected that the status quo permit language would necessarily result in adverse impacts to the biological, physical, historical, or socioeconomic environment of the Sanctuary.

4.4 OTHER REQUIRED EIS SECTIONS

4.4.1 Irreversible and Irretrievable Commitment of Resources

No irreversible or irretrievable commitment of Sanctuary natural resources would occur with the implementation of the proposed regulatory changes under the Proposed Action or Alternative 1. The primary focus of these regulations is to enhance and improve management of the Sanctuary and its natural resources, therefore long-term beneficial impacts would be expected upon implementation of these proposed changes under either the Proposed Action or Alternative 1.

4.4.2 Relationship Between Short-Term Costs and Maintenance and Enhancement of Long-Term Productivity

The short-term costs of updating the existing regulations of the NMSA for the CINMS, under the Proposed Action or Alternative 1, would be minor when compared to benefit to Sanctuary resources resulting from improved resource protection and management. Alternative 1 would have higher short-term costs on human uses than the Proposed Action. As described above, the regulatory changes are designed to protect Sanctuary resources as well as to improve management of the area. Therefore, the minor short-term costs incurred from these regulatory updates would be minimal when compared to the long-term benefits under both the Proposed Action and Alternative 1.

4.4.3 Unavoidable Significant Adverse Impacts

As described in Section 4.1, no unavoidable significant adverse impacts were identified for any of the proposed regulatory updates under either the Proposed Action or Alternative 1. The project would instead be expected to have a long-term beneficial impact on the CINMS and its resources and qualities.

4.4.4 Environmental Justice

Environmental justice is defined by the U.S. EPA as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”

The proposed regulatory updates under the Proposed Action and Alternative 1 would have no negative effect on the natural or physical environment or health that would affect minority or low-income populations or children when compared to the general population. The CINMS is an uninhabited region. In addition, the project would *not increase* the risk or rate of environmental hazard exposure by a minority or low-income population; conversely, it would *reduce* those risks within the CINMS boundary by eliminating potential for hazards to occur. Finally, the proposed regulatory updates under both the Proposed Action and Alternative 1 would have less than significant adverse impacts on human use of the Sanctuary. Therefore, no impacts would occur for any issue related to environmental justice.

4.4.5 Growth-Inducing Impacts

Growth inducement encompasses economic or population growth, or the construction of additional housing in the area surrounding the Proposed Action or Alternative 1. The proposed regulatory changes would incur no growth-inducing impacts since the regulatory changes would not affect growth in the Sanctuary and no development is proposed under the Proposed Action and Alternative 1.

4.5 SOCIOECONOMIC IMPACTS SUMMARY (ALL ALTERNATIVES)

User groups potentially affected by the proposed regulatory changes under the Proposed Action or Alternative 1 include: Offshore oil and gas industry, telecommunications industry, minerals mining operations, shipping and other large vessel operators, ports and harbors, commercial fishing industry, recreational users and associated marine recreation and tourism business operations, marine salvage businesses, motorized personal watercraft users, pilots and charter aircraft businesses, research and scientific users, educational users, and the Department of Defense.

As mentioned throughout sections 4.1 and 4.2, there would be either no impacts to human uses of the Sanctuary from the proposed regulatory changes or such impacts would be less than significant. As a result, no significant socioeconomic impacts to any of these user groups have been identified for any of the proposed regulatory changes for both the Proposed Action and Alternative 1. Although the proposed regulations would have the potential to preclude certain *future* uses, such as mineral mining, and the “opportunity cost” of these uses would not be realized, no significant adverse impact would be anticipated since these uses do not currently occur and are generally not anticipated to occur within the CINMS boundary.

4.6 CUMULATIVE IMPACTS

As stated at the beginning of this chapter, CEQ regulations implementing NEPA require an assessment of the cumulative impacts of a proposed action (40 CFR Parts 1500-1508). A cumulative impact is an “impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over time, and may be additive, countervailing, or synergistic. There are four types of cumulative effects: single action/additive, single action/interactive, multiple action/additive, and multiple action/interactive. This section identifies potential cumulative impacts from the Proposed Action as a single action, along with potential cumulative impacts that may result from a combination of the Proposed Action and other actions that overlap those of the proposed action, and/or whose impact zones overlap areas occupied by resources affected by the proposed action.

As a single action, the Proposed Action is not likely to have additive cumulative impacts on the Sanctuary environment and may potentially only have very limited additive cumulative effects on human uses of the Sanctuary. In terms of the Sanctuary environment, just as the Proposed Action is a single action that would take immediate effect upon its adoption and be applied consistently thereafter, so would its beneficial impact upon the Sanctuary be achieved immediately and remain consistent thereafter. However, in some instances, such as prohibiting the discharge of meals from vessels and clarifying that the discharge regulation prohibits discharge of untreated sewage, there may be some lag time between the adoption of the Proposed Action and recognizable benefits to the Sanctuary environment. This is not seen as an additive cumulative impact as once beneficial impacts are realized they should remain consistent as long as the suite of regulations contained in the Proposed Action are in effect. As a single action, the Proposed Action may result in some additive cumulative impacts upon existing human uses of the Sanctuary. Potential additive cumulative impacts may result from the prohibition of discharging meals from vessels in the case of Sanctuary users opting to travel outside the Sanctuary boundary solely for the purpose of discharging food wastes. Since other existing federal regulations prohibit the discharge of food from 0 to 3 NM offshore (33 CFR Part 151 *et seq.*), the potential cumulative impacts may result strictly from the requirement that food waste be discharged beyond 6 NM offshore from the Islands rather than merely at 3 NM offshore. Additive cumulative impacts are most plausible for users who engage primarily in multi-day trips within the Sanctuary and could result from the cumulative added costs associated with traveling from 3 to 6 NM offshore to dispose of food waste during individual visits to the Sanctuary over the long-term. However, cumulative additive effects are not likely to result if Sanctuary users opt to hold food wastes on board during their visits to the Sanctuary and subsequently discharge them beyond 6 NM offshore during their final departure from the Sanctuary, or dispose of them appropriately once onshore. No other elements of the Proposed Action are anticipated to have the potential for additive cumulative effects on Sanctuary users. This is because the remaining elements of the Proposed Action that have been identified as having the potential for direct but less than significant adverse impacts on human uses of the Sanctuary are either related to potential human uses of the Sanctuary not presently known to occur (e.g. minerals mining and non-fishing-related discharge of fish, fish parts, or chumming material), or are anticipated to result in no substantive difference from the status quo scenario of lawful activities.

As a single action the Proposed Action has the potential for interactive cumulative impacts on the Sanctuary environment, as well as interactive cumulative impacts on human uses of the Sanctuary. In both cases interactive cumulative impacts are anticipated to be beneficial in nature. As discussed in preceding portions of this section, many elements of the Proposed Action are anticipated to have a beneficial impact on components of the Sanctuary environment. These individual beneficial impacts may cumulatively yield an even greater benefit to the Sanctuary environment as a whole, and in turn may benefit select human uses of the Sanctuary. For example, clarifying that discharges from MSDs are only allowed via operable Type I or Type II (USCG classification) MSDs, prohibiting discharge of food wastes within the Sanctuary, and prohibiting introducing or otherwise releasing introduced species may result in potential benefits to Sanctuary water quality, sustain natural food webs (rather than altering these through anthropogenic food sources), and aid in maintaining a natural community structure within the CINMS ecosystem. Each of these potential impacts is singularly beneficial, but these impacts may interact to sustain a healthier Sanctuary environment than possible through any of the singular impacts alone. In turn, these potential interactive cumulative impacts may potentially foster beneficial impacts to human uses such as commercial fishing, recreational fishing, and non-consumptive recreational activities.

Since cumulative impacts may also result from the Proposed Action coupled with other actions that have the potential to impact the same resources, below is a discussion of other actions which have been completed or are being conducted and that are closely related to the Proposed Action.

- **Federal Marine Reserves and Conservation Areas and CINMS Boundary Expansion.** Two other major projects are being developed by CINMS: the consideration of establishing federal marine reserves within the Sanctuary and a potential boundary expansion for the CINMS. As described in Chapter 1.0 (as well as the Marine Zoning Action Plan and Boundary Evaluation Action Plan in Vol. 1, Draft Management Plan), these processes will be considered separately and evaluated in a separate EIS and SEIS, respectively. Therefore, the cumulative effects of these projects are currently unknown. However, since the regulatory changes proposed here would not affect any of the uses (e.g., fishing) that would occur as a result of designating additional marine reserves in federal waters, and the existing or proposed CINMS regulations would not necessarily apply to an expanded boundary, were the boundary to be expanded, cumulative effects of these projects combined with the proposed regulatory changes would not be considered significant at this time.
- **Pacific Coast Groundfish Fishery Management Plan and Essential Fish Habitat Designation.** A 2000 court order in *American Oceans Campaign et al. v. Daley et al.*, Civil Action No. 99-982 (GK) (D.D.C. September 14, 2000) required the Pacific Fishery Management Council (and several other fishery management councils) to prepare EISs to evaluate the effects of fishing on essential fish habitat (EFH) and identify measures to minimize those impacts, to the extent practicable. In response, in 2005 the National Marine Fisheries Service prepared a DEIS, *Pacific Coast Groundfish Fishery Management Plan Essential Fish Habitat Designation and Minimization of Adverse Impact*. In this DEIS the National Marine Fisheries Service considers: alternatives for designation of EFH, alternatives for designation of habitat areas of particular concern (HAPC), and alternatives for minimization of adverse effects of fishing on EFH, and data gaps. The Pacific Fishery Management's Council's preferred alternative included fishing closures within the federal waters of the Sanctuary previously identified by the California Department of Fish and Game as part of that agency's recommended network of marine reserves and marine conservation areas. Since the Sanctuary's proposed action does not have direct effects on the fishing uses affected by the pending EFH action, cumulative effects of this action with the proposed regulatory changes would not be significant.
- **Channel Islands National Park Management.** Existing NPS regulations in effect at CINP coupled with the Proposed Action would have additive cumulative impacts upon illegal MPWC use as both would ban this activity within waters of the Park, and each regulation has an associated penalty for illegal use. CINP current management, and future implementation of a new General Management Plan currently under development, address the terrestrial management issues for the CINP and develop long-term policy recommendations to enhance the management of the Channel Islands under CINP jurisdiction. Since the CINP and CINMS work closely together in managing the overlapping areas of their jurisdiction, the regulatory updates proposed by the CINMS would complement future management strategies of the terrestrial environment. Cumulatively, interactive beneficial impacts of the two agencies' management plans would be expected to enhance and protect the environment in and around the CINMS.
- **U.S. Navy Point Mugu Sea Range Expansion.** In 2002 the U.S. Navy published a Final Environmental Impact Statement in which they analyzed the impacts of expanding the Naval Air Warfare Center Weapons Division Point Mugu in order to: accommodate Theatre Missile Defense testing and training, to accommodate an increase in Fleet

training exercises and special warfare training, and to modernize facilities at Naval Air Station Point Mugu and San Nicolas Island to support existing and future operations. A current description of Navy activities that may occur within the Sanctuary is described at section 3.5.9 of this DEIS, and a description of the potential impacts of these activities is described at section 4.1.15 of this DEIS.

- **Offshore Oil and Gas Leasing.** Currently, there are 79 Outer Continental Shelf (OCS) oil and gas leases offshore of Southern California. These include 39 producing leases and 36 non-producing leases offshore from San Luis Obispo, Santa Barbara, and Ventura Counties and four producing leases offshore from Los Angeles and Orange Counties. Production from these leases is expected to continue for the next five to 20 years. The Minerals Management Service (MMS) currently has no proposals for decommissioning offshore facilities. Development of the 36 non-producing leases is uncertain due to ongoing litigation. In addition, four undeveloped leases are under appeal. MMS has prepared six Environmental Assessments (EAs) to analyze the environmental impacts of granting lease suspensions for the undeveloped leases and six Consistency Determinations for the California Coastal Commission. If lease suspensions are granted oil and gas exploration may occur within those leases, one of which (the Cavern Point Unit) straddles the Sanctuary's eastern boundary. Exploration activities, depending on how they are conducted, could potentially lead to adverse impacts on Sanctuary resources and qualities (e.g., seismic surveys may possibly result in acoustic impacts on marine life).
- **Port of Long Beach Expansion.** According to the *Port of Long Beach Master Plan* (2003), the Los Angeles Port Authority plans to expand capacity of the harbor, which will increase both the number and size of the vessels that use the Santa Barbara Channel. Because large vessel traffic tends to adhere to the voluntary traffic separation scheme established in the Santa Barbara Channel, and since neither of the associated shipping lanes lies within 1 NM of Islands shores, no cumulative impact on large vessel traffic is expected to result from the Proposed Action coupled with the Port of Long Beach Expansion.
- **Proposed Liquefied Natural Gas Terminals.** Two separate proposals to develop liquefied natural gas terminals to the east of the Sanctuary (outside the Sanctuary boundary) are currently being developed and evaluated. Crystal Energy is proposing to use Platform Grace, an existing oil and gas platform currently owned by Venoco, Inc., as an LNG import and regasification facility. The platform is located approximately 12.1 miles offshore from Ventura County, in federal waters and approximately 10 miles north of Anacapa Island. BHP Billiton LNG International, Inc. submitted a Deepwater Port Act application to the U.S. Coast Guard and the U.S. Maritime Administration (MARAD) and an application for a lease of State lands to the California State Lands Commission to own, construct and operate Cabrillo Port LNG Deepwater Port, to be located about 14 miles off the coast of Ventura County and about 12.43 miles from the nearest CINMS boundary. While neither proposal would overlap with the Proposed Action, both have the potential to result in an impact on Sanctuary resources and qualities either directly, or indirectly. Potential indirect impacts of concern in terms of cumulative impacts would be the potential for increased shipping traffic associated with both proposed facilities. This potential for increased traffic for these facilities coupled with the potential for increased shipping traffic resulting from the Port of Long Beach

expansion could result in additive cumulative impacts upon Sanctuary resources and qualities from large vessel traffic.

- **Proposed Aquaculture Facility.** The Hubbs-SeaWorld Research Institute (HSWRI), with support from ChevronTexaco Environmental Management Corporation and Venoco, Inc., is seeking approvals to operate an experimental marine aquaculture project for three years at Platform Grace, which is located about 12.1 miles offshore from Ventura County, and approximately 10 miles north of Anacapa Island, in federal waters. The potential for release of introduced species from this facility that could subsequently enter the Sanctuary and injure Sanctuary resources or qualities could act against the Sanctuary's Proposed Action in its intent to deter such impacts. The NMSP will have the opportunity to review this and any similar future proposed actions to ensure that the likelihood of releasing introduced species from such facilities is minimal to none.
- **California Legislation on Large Passenger Vessels.** In 2004 the Governor of California signed legislation effective in January 2005 pertaining to discharges from large passenger vessels within the State waters of California (0 to 3 NM offshore). California Assembly Bill (AB) 2672 prohibits such vessels from dumping sewage from toilets within three miles of shore in California waters. In addition, California AB 2093 prohibits large passenger vessels of 300 gross registered tons or more from discharging "graywater" in State waters. Graywater in this case is defined as drainage from dishwashers, showers, laundry, bath and washbasins. AB 2093 also establishes specific reporting requirements for releases of graywater in State waters of the four national marine sanctuaries in offshore from California, including CINMS. No large passenger vessels are currently known to visit the Sanctuary. Should this activity be conducted within the Sanctuary in the future it may yield an additive cumulative impact in terms of large vessel traffic within the Sanctuary, especially when coupled with the potential for increase in large vessel traffic from the Port of Long Beach expansion and proposed liquefied natural gas terminals in the region. There is also the potential for additive cumulative impacts of these State actions coupled with the Proposed Action upon large passenger vessel traffic. Such vessels would not be permitted to approach within 1 NM of shore, would not be allowed to discharge graywater, sewage from toilets, or food waste within 3 NM, and would not be allowed to discharge untreated sewage and food waste from 3 to 6 NM offshore.

While the Proposed Action does in effect overlap with additional applicable Federal and State regulations (see Chapter 5), no other cumulative effects are anticipated. This is due to: the clarifying nature of many elements of the Proposed Action, which are not anticipated to result in any individual nor cumulative new impacts upon existing human uses; the elements of the Proposed Action aimed at prohibiting activities which have not historically, do not currently, and have not been proposed to occur in the foreseeable future (e.g. minerals mining, altering the seabed from 2 to 6 NM offshore) and therefore are not predicted to have individual or cumulative significant impacts on such activities; and those elements of the Proposed Action aimed at complementing existing prohibitions enforced by other agencies, with the intent of adding greater civil penalty deterrence against already illegal activities when they occur within the Sanctuary, or simply to bring greater place-based focus to the importance of protecting the nationally significant resources and qualities of the Channel Islands.

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**5 EXISTING APPLICABLE FEDERAL AND STATE
REGULATIONS**

5.0 FEDERAL AND STATE LAW

The following summaries of applicable federal regulations and state law are arranged by the following categories:

- Offshore Energy Source and Mineral Exploration and Development
- Discharging or Depositing Matter into the Marine Environment
- Protection of Submerged Lands
- Navigation of Vessels
- Protection of Marine Mammals, Seabirds, and Sea Turtles
- Protection of Historical/Cultural Resources in the Marine Environment
- Introduced Species in the Marine Environment
- Operation of Motorized Personal Watercraft
- Other Federal and State Laws

5.1 OFFSHORE ENERGY SOURCE AND MINERAL EXPLORATION AND DEVELOPMENT

Federal law

Oil Pollution Act of 1990 (OPA), 33 U.S.C. 2701 *et seq.*, *inter alia*

OPA amends Section 311 of the CWA, 33 U.S.C. 1321 *et seq.*, to clarify federal response authority, increase penalties for spills, establish U.S. Coast Guard response organizations, require tank vessel and facility response plans, and provide for contingency planning in designated areas. OPA, however, does not preempt states' rights to impose additional liability or other requirements with respect to the discharge of oil within a state or to any removal activities in connection with such a discharge.

OPA is a comprehensive statute designed to expand oil spill prevention, preparedness, and response capabilities of the federal government and industry. OPA establishes a new liability regime for oil pollution incidents in the aquatic environment and provides the resources necessary for the removal of discharged oil. OPA consolidates several existing oil spill response funds into the Oil Spill Liability Trust Fund (Trust Fund), resulting in a \$1-billion fund to be used to respond to, and provide compensation for damages caused by, discharges of oil. In addition, OPA provides new requirements of response planning by both government and industry and establishes new construction, manning, and licensing requirements for tank vessels. OPA also increases penalties for regulatory noncompliance and broadens the response and enforcement authorities of the federal government.

Title I of OPA contains liability provisions governing oil spills modeled after CERCLA, 42 U.S.C. 9601 *et seq.*, and Section 311 of the CWA. Specifically, Section 1002(a) of OPA provides that the responsible

party for a vessel or facility from which oil is discharged, or which poses a substantial threat of a discharge, is liable for:

- Certain specified damages resulting from the discharged oil; and
- Removal costs incurred in a manner consistent with the National Contingency Plan.

The scope of damages for which there may be liability under Section 1002 of OPA includes:

- Natural resource damages, including the reasonable costs of assessing these damages;
- Loss of subsistence use of natural resources;
- Real or personal property damages;
- Net loss of tax and other revenues;
- Loss of profits or earning capacity; and
- Net cost of additional public services provided during or after removal actions.

Submerged Lands Act (SLA), (43 U.S.C. 1301 *et seq.*)

Under the SLA the location of energy and mineral resources determines whether or not they fall under state control. The SLA granted states title to the natural resources located within three miles of their coastline (three marine leagues for Texas and the Gulf coast of Florida). For purposes of the Submerged Lands Act, the term “natural resources” includes oil, gas and all other minerals and marine animal and plant life. States’ implementation of the SLA is discussed below under State Law.

Outer Continental Shelf Lands Act (OCSLA), 43 U.S.C. 1331 *et seq*

The OCSLA established federal jurisdiction over submerged lands on the OCS seaward of state boundaries. Under the OCSLA, the Secretary of the Interior is responsible for the administration of mineral exploration and development of the OCS. The OCSLA empowers the Secretary of the Interior to grant leases to the highest qualified responsible bidder(s) on the basis of sealed competitive bids and to formulate such regulations as necessary to carry out the provisions of the OCSLA. The OCSLA provides guidelines for implementing an OCS oil and gas exploration and development program, and authorities for ensuring that such activities are safe and environmentally sound. The basic goals of the OCSLA include the following:

- To establish policies and procedures for managing the oil and natural gas resources of the OCS that are intended to result in expedited exploration and development of the OCS in order to achieve national economic and energy policy goals, assure national security, reduce dependence on foreign sources, and maintain a favorable balance of payments in world trade;
- To preserve, protect, and develop oil and natural gas resources of the OCS in a manner that is consistent with the need (a) to make such resources available to meet the nation’s energy needs as rapidly as possible; (b) to balance orderly resource development with protection of the human, marine, and coastal environments; (c) to ensure the public a fair and equitable return on the resources of the OCS; and (d) to preserve and maintain free enterprise competition;

- To encourage development of new and improved technology for energy resource production, which will eliminate or minimize risk of damage to the human, marine, and coastal environments; and
- To provide opportunities for state and local government participation in policy and planning decisions made by the federal government relating to exploration for, and development and production of, minerals on the OCS.

Deep Seabed Hard Mineral Resources Act, 30 U.S.C. 1401 *et seq.*

The Deep Seabed Hard Mineral Resource Act provides for regulations for developing deep seabed hard minerals, requires consideration of environmental impacts prior to issuance of mineral development permits, and requires monitoring of environmental impacts associated with any mineral development activities. With regard to minerals on the deep seabed, seabed nodules contain nickel, copper, cobalt and manganese - minerals important to many industrial uses. No commercial deep seabed mining is currently conducted, nor is such activity anticipated in the near future. However, four licenses have been issued under the Deep Seabed Hard Mineral Resources Act for exploration of seabed areas in the Clarion-Clipperton zone of the South Pacific Ocean.

Ocean Thermal Energy Conversion Act (OTEC Act), 42 U.S.C. 9101 *et seq.*

With regard to alternative energy sources from the ocean, the OTEC Act established a licensing program for facilities and plants that would convert thermal gradients in the ocean into electricity. The OTEC Act directed the Administrator of NOAA to establish a stable legal regime to foster commercial development of OTEC. In addition, the OTEC Act directed the Secretary of the department in which the USCG is operating to promote safety of life and property at sea for OTEC operations, prevent pollution of the marine environment, clean up any discharged pollutants, prevent or minimize any adverse impacts from construction and operation of OTEC plants, and ensure that the thermal plume of an OTEC plant does not unreasonably impinge on and thus degrade the thermal gradient used by any other OTEC plant or facility, or the territorial sea or area of national resource jurisdiction of any other nation unless the Secretary of State has approved such impingement after consultation with such nation. The OTEC Act also assigned responsibilities to the Secretary of State and the Secretary of Energy regarding OTEC plants.

State law

Submerged Lands Act (SLA), (43 U.S.C. 1301 *et seq.*)

Pursuant to the authority of the federal SLA state authorities range in the nature and extent of their control over ocean energy and mineral resources on state submerged lands. The range depends on each state's evaluation of different policy interests, such that activities may be restricted in certain areas and allowed in others. State management authority for oil and gas exploration and production on state submerged lands may be implemented by more than one state entity. Also, state management of energy and mineral resources is often addressed within the context of a broader state coastal management plan.

State policies also affect energy and mineral resource development on the OCS. As indicated above, federal authorities such as the OCSLA provide for consultation and coordination with affected coastal states.

5.2 DISCHARGING OR DEPOSITING OTHER MATTER INTO THE MARINE ENVIRONMENT

Federal Law

Act to Prevent Pollution from Ships (APPS) 33 U.S.C. 1901 *et seq.*

a. Oil and Noxious Liquid Substances.

The Act to Prevent Pollution from Ships, as originally enacted, implemented Protocols I and II, and Annexes I and II, of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL). Annex I of MARPOL establishes requirements to prevent the discharge of oil except in accordance with specific conditions. Annex II provisions cover the discharge of noxious liquid substances. (Annex III, which addresses the prevention of pollution by harmful substances carried by sea in packaged forms, or in freight containers, portable tanks, or road and rail wagons, is implemented by the Hazardous Material Transportation Act, 49 U.S.C. 5101 *et seq.*, inter alia.)

The APPS applies to all United States flag ships anywhere in the world and to all foreign flag vessels operating in the navigable waters of the United States or while at a port or terminal under the jurisdiction of the United States. The oil and noxious liquid substances provisions apply only to seagoing ships. The regulations implementing Annex I and Annex II of MARPOL limit discharges of oil and noxious substances, establish report requirements for discharges, and establish specific requirements for monitoring equipment and record keeping aboard vessels. In particular, the regulations require that vessels covered by APPS and MARPOL keep Oil Record Books in which all discharges, disposal, and transfers of oil are recorded.

b. Garbage and Plastics.

The APPS was amended by the Marine Plastic Pollution Research and Control Act of 1987 (MPPRCA), which implemented the provisions of Annex V of MARPOL relating to garbage and plastics. Annex V of MARPOL and the regulations implementing it apply to all vessels subject to MARPOL, whether seagoing or not, regardless of flag, on the navigable waters of the United States and in the EEZ of the United States. It applies to United States flag vessels wherever they are located.

Under the regulations implementing the APPS, the discharge of plastics, including synthetic ropes, fishing nets, plastic bags, and biodegradable plastics, into the water is prohibited. Discharge of floating dunnage, lining, and packing materials is prohibited in the navigable waters and in areas offshore less than 25 nautical miles from the nearest land. Under APPS, the definition of ship includes fixed or floating platforms. There are separate garbage discharge provisions applicable to these units. For these platforms, and for any ship within 500 meters of these platforms, disposal of all types of garbage is prohibited. In addition, all manned, oceangoing United States flag vessels of 12.2 meters or more in length engaged in commerce, and all manned fixed or floating platforms subject to the jurisdiction of the United States, are required to keep records of garbage discharges and disposals. The implementing regulations specify that no person may discharge into the sea, if the distance from nearest land is less than 12 nautical miles, food wastes, paper products, rags, glass, metal, bottles, crockery and similar refuse. However, such garbage and trash may be discharged outside of three nautical miles from nearest land after it has been passed through a grinder or comminuter so that it passes through a screen with openings no greater than 25 millimeters (one inch).

Carriage of Liquid Bulk Dangerous Cargoes, 46 U.S.C. 3701–3718, governs the carriage of liquid bulk dangerous cargoes such as oil or hazardous materials. The chapter applies to any tank vessel operating in United States navigable waters or transferring oil or hazardous materials in any port subject to U.S. jurisdiction, with exemptions for certain vessels (Section 3702). The Secretary is required to issue regulations for the design, construction, alteration, repair, maintenance, operation, equipping, personnel qualification, and manning of vessels subject to the chapter, necessary to protect life and property, for navigation and vessel safety, and protection of the marine environment (Section 3703; regulations are found in 33 CFR and 46 CFR). Minimum standards for tank vessel construction are provided (Section 3703a); requirements for coastwise trade vessels (Section 3704); as well as minimum standards for crude oil tankers, product carriers, tankers, and self-propelled tank vessels, with certain exemption as authorized by the Secretary (Sections 3705–3709). The Secretary is directed to establish a marine safety information system to contain information about vessels subject to the chapter (Section 3717). Civil or criminal penalties may be assessed for violations of the chapter, including revocation of Customs Service clearance (Section 3718).

Clean Vessel Act of 1992, subtitle F, 5601 to 5608, of Title V of Pub. L. 102–587, amending 16 U.S.C. 777c and 777g and see 33 U.S.C. 1322 note

The purpose of the Clean Vessel Act is to provide funds to states for the construction, renovation, operation and maintenance of pumpout stations and waste reception facilities. The act requires the Department of the Interior to issue guidance on what constitutes adequate and reasonably available pumpout facilities and waste reception facilities. In order to receive a grant, coastal states are to conduct a survey to determine the number and location of such stations and facilities and the number of recreational vessels in their coastal waters with toilets and develop and submit to the Department of the Interior for approval a plan for any construction or renovation necessary to provide adequate and reasonably available stations and facilities.

Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990, 16 U.S.C. 1455b

Section 6217 of Coastal Zone Act Reauthorization Amendments of 1990 required the coastal states with federally approved coastal zone management plans to develop and submit coastal nonpoint source pollution control programs for approval by NOAA and the U.S. Environmental Protection Agency (EPA). The submissions were to lay out a state program to restore and protect coastal waters by providing for the implementation of management measures developed by the U.S. EPA. The statute gave states 30 months from the date of publication of the final U.S. EPA guidance to submit a program to NOAA and U.S. EPA for approval. The statute required that penalties be levied if a state failed to submit an approvable program within the allotted time. There has been no need to assess penalties as yet, as all the states have submitted programs found to be conditionally approvable and some have later been fully approved.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, (CERCLA), 42 U.S.C. 9601 *et seq.*

CERCLA is designed to respond to releases of hazardous substances and protect public health and environmental quality including natural resources.

CERCLA provides for the following two possible actions to protect the public and the environment from the harmful effects of a hazardous substance spill. Any combination of these two may be used at a particular spill.

(1) Response: CERCLA authorizes the U.S. to clean up the spilled substance either at the expense of the responsible party or with funds from the Superfund. CERCLA 104(a)(1). Example of steps include: dredging contaminated sediments, repairing leaking containers, collecting rain water runoff, and relocating displaced residents.

(2) Damages for natural resource injuries: CERCLA authorizes the trustees for natural resources to seek damages from responsible parties to restore or replace natural resources injured or destroyed by exposure to hazardous substances. CERCLA 107(a)(4)(C) and 107(f).

Federal Water Pollution Control Act, also informally called the **Clean Water Act (CWA)**, 33 U.S.C. 1251 *et seq.*

The CWA establishes the basic scheme for restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. The primary mechanism in the CWA regulating the discharge of pollutants is the National Pollutant Discharge Elimination System (NPDES), which is administered by the U.S. EPA. Under the NPDES program, a permit is required from U.S. EPA or an authorized state for the discharge of any pollutant from a point source into the waters of the United States. This includes discharges associated with oil and gas development on federal leases beyond state waters. A NPDES permit for certain storm water discharges also is required. In the case of discharges to the territorial sea or beyond, permits are also subject to the ocean discharge criteria developed under Section 403 of the CWA. Permits for discharges into the territorial sea or internal waters may be issued by states following approval of their permit program by U.S. EPA; in the absence of an approved state permit program, and for discharges beyond the territorial sea, U.S. EPA is the permit-issuing authority.

The CWA was amended in 1987 to include the current non-point source (NPS) program. Under this program (Section 319), states must develop management programs to address NPS runoff, including the identification of best management practices and measures. In addition, Section 319 authorizes grants to assist the states in implementing their approved management programs.

The CWA generally prohibits discharges of oil and hazardous substances into coastal or ocean waters except where permitted under MARPOL. The USCG investigates and responds to discharges of oil and hazardous substances into coastal or ocean waters in accordance with the National Contingency Plan. The USCG, with the cooperation of U.S. EPA, generally administers the National Contingency Plan when oil or a hazardous substance is discharged into coastal or ocean waters. Regional contingency plans and area contingency plans are developed to implement the NCP.

The CWA (Section 312) requires vessels with installed toilet facilities and operating on the navigable waters of the United States to contain operable marine sanitation devices certified as meeting standards and regulations promulgated under Section 312. Section 312 also allows establishment of zones where discharge of sewage from vessels is completely prohibited. Amendments made to Section 312 in 1996 require, where appropriate, the use of marine pollution control devices for operational, non-sewage, discharges from vessels of the Armed Forces.

Publicly owned sewage treatment facilities must, at a minimum, meet effluent limitations based on effluent reductions by secondary treatment, except for certain facilities discharging to coastal waters for which U.S. EPA has approved a waiver under Section 301(h).

Section 320 of the CWA establishes the National Estuary Program, which uses a consensus-based approach for protecting and restoring estuaries. There are currently 28 estuaries in the program.

The U.S. Army Corps of Engineers (USACE) implements the Section 404 permit program. Under Section 404, a permit is required for the discharge of dredged or fill materials into the waters of the U.S. that lie inside of the baseline for the territorial seas and fill materials into the territorial seas within three miles of shore. Although USACE has the permitting responsibility under the Section 404 program except in certain waters of two states (Michigan and New Jersey), which have assumed the authority, U.S. EPA is authorized to review and comment on the impact of proposed dredge and fill activities and to prohibit

discharges that would have an unacceptable impact on municipal water supplies, shellfish beds and fishery areas, wildlife and recreational areas. U.S. EPA, in consultation with USACE, is charged with developing guidelines to be used in evaluating discharges subject to Section 404. (40 CFR Part 2301.) The Section 404 permit requirement is the cornerstone for the current wetlands regulatory program. If the USACE or U.S. EPA determines that a certain property is a jurisdictional wetland, no one can discharge dredged or fill materials into it without a Section 404 permit. USACE and U.S. EPA also have cooperative agreements with the Natural Resources Conservation Service and rely on its determinations as to the presence of wetlands on agricultural lands.

Ocean Dumping Act (Titles I and II of the Marine Protection, Research, and Sanctuaries Act of 1972), 33 U.S.C. 1401 *et seq.*

The Ocean Dumping Act provides the basic authority for the U.S. EPA and the USACE to regulate ocean dumping (Title I) and for the Department of Commerce, through NOAA, to carry out research on the effects of ocean dumping and other man-induced changes on ocean systems (Title II).

Title I of the act: (1) prohibits any person, without a permit, from transporting from the United States any material for the purpose of dumping it into ocean waters (defined to mean those waters of the open seas lying seaward of the baseline from which the territorial sea is measured), and (2) in the case of a vessel or aircraft registered in the United States or flying the U.S. flag or in the case of a U.S. agency, prohibits any person, without a permit, from transporting from any location any material for the purpose of dumping it into ocean waters. Title I also prohibits any person, without a permit, from dumping any material transported from a location outside the United States into the territorial sea, or the contiguous zone extending 12 nautical miles seaward from the baseline of the territorial sea to the extent that it may affect the territorial sea or the territory of the United States. U.S. EPA issues permits regulating the ocean dumping, and the transportation for the purpose of dumping, of all material except dredged material, which is permitted by USACE. USACE permits are subject to U.S. EPA review and concurrence. The specific environmental criteria used to evaluate permit applications are developed by U.S. EPA; in the case of dredged material, this is done in coordination with USACE.

In developing criteria for the evaluation of permit applications, the statute provides that the following must be considered: (1) the need for the proposed dumping; (2) the effect of the dumping on human health and welfare, fisheries resources, marine ecosystems, and shorelines; (3) the persistence and permanence of the effects of the dumping; (4) the effect of dumping particular volumes and concentrations; (5) appropriate locations and methods of disposal or recycling, including land-based alternatives; and (6) the effect on alternate uses of the oceans.

The ocean dumping of sewage sludge and industrial waste is prohibited. In addition, radiological, chemical, or biological warfare agents, high-level radioactive waste, and medical waste may not be dumped. States may generally adopt and enforce requirements for ocean dumping activities that occur in their jurisdictional waters.

Title II of the Ocean Dumping Act requires the Department of Commerce, in coordination with the department in which the U.S. Coast Guard is operating (currently the Department of Homeland Security) and U.S. EPA, to conduct a comprehensive and continuing program of monitoring and research on the effects of dumping of material into ocean waters, coastal waters or into the Great Lakes. The title further requires the Department of Commerce, in close consultation with other appropriate departments, to conduct a comprehensive and continuing program of research into the possible long-range effects of pollution, over-fishing and human-induced changes of ocean ecosystems. The title specifies that the program must include continuing monitoring programs to assess the health of the marine environment, including but not limited to the monitoring of bottom oxygen concentration contaminant levels in biota,

sediments and the water column, diseases in fish and shellfish, and changes in types and abundance of indicator species.

Shore Protection Act of 1988, 33 U.S.C. 2601 *et seq.*

Under the Shore Protection Act of 1988, municipal or commercial waste cannot be transported by a vessel in coastal waters without a permit from the Department of Transportation. Municipal or commercial waste includes solid waste as defined by the Resource Conservation and Recovery Act, but excludes waste generated by the vessel during normal operations, construction debris, dredged or fill material, and sewage sludge. The loading, securing and off loading of these wastes must be conducted in a manner to minimize any waste deposited into coastal waters.

Solid Waste Disposal Act also known as the Resource Conservation and Recovery Act, 42 U.S.C. 6901 *et seq.*

Governs treatment, storage and disposal of solid and hazardous waste. The act also has as a goal the reduction of generation of hazardous waste.

Toxic Substances Control Act 15 U.S.C. 2601 *et seq.*

This is the first comprehensive legislation governing toxic substances, including providing the federal government authority to prevent unreasonable risk of injury to health or the environment, particularly imminent hazards.

United States Public Vessel Medical Waste Anti-Dumping Act of 1988, 33 U.S.C. 2501 *et seq.*

This act prohibits public vessels from discharging medical waste except in extremely limited circumstances, because of the serious and widespread risks to public health and to the welfare of coastal communities. Potentially infectious medical waste may only be discharged by a public vessel if: (1) the health or safety of individuals on board the vessel is threatened or during a time of war or national emergency; (2) the waste is released beyond 50 nautical miles from the nearest land; and (3) the waste is sterilized, properly packaged, and sufficiently weighted to prevent it from coming ashore.

Organotin Anti-Fouling Paint Control Act of 1988, 33 U.S.C. 2401 *et seq.*

Organotin biocides are added to paints to protect the bottom of boats from encrusting organism buildup. Because organotin has been shown to be toxic, it may pose unreasonable risks to marine and freshwater organisms. The act's purpose is to protect the aquatic environment by reducing the quantities of organotin entering the waters of the United States. The U.S. EPA is primarily responsible for the administration and enforcement of this statute.

The act generally prohibits boats less than 25 meters in length from using anti-fouling paint containing organotin. Aluminum hulls and lower drive shaft units of marine engines (outboard motors) are excepted from this act and allowed to use this paint. Penalties are available for violations. The U.S. EPA, in consultation with NOAA, was directed to monitor the ecological effects of organotin in estuaries and coastal waters for ten years beginning in 1988.

State Law

California Hazardous Waste Control Law imposes obligations on facilities for the generation of hazardous waste. The law applies to federal facilities insofar as the law requires permitting, inspections, and monitoring. State waste disposal standards, reporting duties, and submission to state inspections are required of federal facilities.

California Administrative Code, Sections 66001 through 67181 contains California's hazardous materials regulations.

California Code of Regulations Title 26 identifies wastes subject to regulations as hazardous wastes under this division and subject to the notification requirements of Health and Safety Code Section 25153.6. It provides the criteria used by the California Department of Toxic Substances Control to identify characteristics of hazardous wastes, identifies characteristics of hazardous waste, and lists particular hazardous wastes. It includes sampling procedures and requires the use of the best available technology.

California Integrated Waste Management Act of 1989 specifies waste reduction mandates for municipal solid waste facilities. California Code of Regulations Title 27, Natural Resources, Integrated Waste Management, specifies guidelines for solid waste planning (including waste diversion goals), solid waste facilities permits, and regulations for daily operations of municipal solid waste landfills. Daily operations include regulations for daily and interim cover materials, and closure/post-closure plans.

The Porter-Cologne Water Quality Control Act protects all waters of the state for the use and enjoyment of the people of California and declares that the protection of water resources be administered by the regional water quality control boards with statewide coordination managed by the State Water Resources Control Board.

Recent State Assembly Bills

In September 2004 Governor Arnold Schwarzenegger signed three assembly bills (AB) regulating discharges from "large passenger vessels," effectively cruise ships. AB 471 bans cruise ships from incinerating waste off California's coast. (AB 471 is now part of California Health and Safety code, Division 26, Part 2, Chapter 3.3, commencing with Section 39630.) AB 2093 prohibits cruise ships from dumping sewage from kitchens, sinks, and showers (graywater) in state waters. AB 2672 prohibits cruise ships from dumping sewage from toilets within three miles of shore. All three bills apply solely to California waters, which extend to 3 NM offshore.

5.3 PROTECTION OF SUBMERGED LANDS

Federal Law

Rivers and Harbors Act of 1899, 33 U.S.C. 401 *et seq.*

The Rivers and Harbors Act prohibits the unauthorized obstruction of navigable waters of the United States. The construction of any structure or the excavation or fill in the navigable waters of the United States is prohibited without a permit from the USACE. Section 13 of the Act also prohibits the discharge of refuse into navigable waters, but has been largely superseded by the CWA.

Wreck Act, 33 U.S.C. 409 *et seq.*

The Act prohibits the anchoring or tying of vessels or other craft in navigable channels in a manner that prevents or obstructs passage of other vessels or craft. Also, the act places a duty on an owner, lessee or operator of a vessel, raft or other craft that has sunk in a navigable channel to immediately mark the wreck with a buoy or beacon and to maintain such marker until the wreck is removed or abandoned. The owner, lessee, or operator has the duty to commence the immediate removal of the wreck.

(See also 5.1.1, above, for descriptions of the Submerged Lands Act and Outer Continental Shelf Lands Act)

5.4 NAVIGATION OF VESSELS

Federal Law

Carriage of Goods by Sea Act, 46 App. U.S.C. 1300–1315

The Carriage of Goods by Sea Act governs every bill of lading or similar document of title, which is evidence of a contract for the carriage of goods by sea to or from U.S. ports, in foreign trade. The Act provides for the duties and rights of the carrier, as well as the responsibilities and liabilities of the carrier and ship regarding, for example, seaworthiness, cargo and contents of a bill, as well as rights and immunities of the carrier and ship.

Harter Act, 46 App. U.S.C. 190–196

The act requires owners, masters or agents of any vessel transporting merchandise or property from or between United States ports and foreign ports to issue to shippers a bill of lading, or shipping document, stating, among other things, the number of packages, or quantity, condition of merchandise, and weight. Such document shall be *prima facie* evidence of receipt of the merchandise. It allows vessel owners limitation of liability for losses resulting from errors in navigation, dangers of sea and acts of God. Similar to the Carriage of Goods by Sea Act, except that the Harter Act: does not relieve the owner for errors in navigation if there was failure to exercise due diligence to provide a seaworthy vessel; has no statute of limitations; and does not provide a limit of liability for loss or damage of cargo.

Ports and Waterways Safety Act of 1972, as amended, (PWSA), 33 U.S.C. 1221–1236

The PWSA, as amended by the Port and Tanker Safety Act of 1978 (PTSA), P.L. 95–474, and the Oil Pollution Act of 1990, is designed to promote navigation, vessel safety, and protection of the marine environment. Generally, the PWSA applies in any port or place under the jurisdiction of the United States, or in any area covered by an international agreement negotiated pursuant to 33 CFR 2.05–30.

The PWSA authorizes the USCG to establish vessel traffic separation schemes (VTSSs) for ports, harbors, and other waters subject to congested vessel traffic. The VTSS apply to commercial ships, other than fishing vessels, weighing 300 gross tons (270 gross metric tons) or more. OPA amended the PWSA to mandate that appropriate vessels must comply with the VTSSs.

The PWSA was amended by the PTSA in 1978. Under the PTSA, Congress finds: that navigation and vessel safety and protection of the marine environment are matters of major national importance; that increased vessel traffic in the Nation's ports and waterways creates substantial hazard to life, property or the marine environment; that increased supervision of vessel and port operations is necessary in order to (1) reduce the possibility of vessel or cargo loss, or damage to life, property or the marine environment; (2) prevent damage to structures in, on, or immediately adjacent to the navigable waters of the United States or the resources within such waters; (3) insure that vessels operating in the navigable waters of the United States shall comply with all applicable standards and requirements for vessel construction, equipment, manning and operational procedures; and (4) insure that the handling of dangerous articles and substances on the structures in, on, or immediately adjacent to the navigable waters of the United States is conducted in accordance with established standards and requirements; and that advance planning is critical in determining proper and adequate protective measures for the Nation's ports and waterways and the marine environment, with continuing consultation with other federal agencies, state

representatives, affected users and the general public, in the development and implementation of such measures.

The PTSA provides broader regulatory authority over regulated and non-regulated areas. The PTSA provides for improvements in the supervision and control of all types of vessels operating in navigable waters of the United States, and in the safety of foreign or domestic tank vessels that transport or transfer oil or hazardous cargoes in ports or places subject to United States jurisdiction. The PTSA also reflects certain tank vessel standards and requirements accepted internationally, specifically those developed by the International Conference on Tanker Safety and Pollution Prevention.

5.5 PROTECTION OF MARINE MAMMALS, SEABIRDS AND SEA TURTLES

Federal Law

Endangered Species Act of 1973 (ESA), 16 U.S.C. 1531–1544

The ESA protects species of plants and animals listed as threatened or endangered. The Secretary of the Interior and the Secretary of Commerce determine, through regulations, whether any species are endangered or threatened. The secretaries also are required to designate critical habitat and develop and implement recovery plans for threatened and endangered species. Federal agencies must ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of critical habitat.

The ESA prohibits the taking of any member of an endangered species. "Take" is defined broadly and includes harassment, harm, pursuit, hunting, shooting, wounding, killing, trapping, capturing, or collecting, or attempting to engage in any of this type of conduct. The requirements of the ESA are enforceable.

Fur Seal Act Amendments of 1983, 16 U.S.C. 1151–1175

The Fur Seal Act Amendments prohibit the taking of fur seals in the North Pacific Ocean, except as provided by the act. Indians, Aleuts, and Eskimos who dwell on the North Pacific Ocean may take fur seals for subsistence purposes. The Secretary of Commerce is responsible for regulating the taking of fur seals. The Amendments authorize a North Pacific Fur Seal Commission.

The Fur Seal Act Amendments also authorize the Secretary to administer the fur seal rookeries and other federal real and personal property on the Pribilof Islands.

Lacey Act Amendments of 1981, 16 U.S.C. 3371–3378

The Lacey Act prohibits domestic and international trafficking in and possession of protected fish, wildlife, and plants. It does so in two ways. First, it requires that most shipments of fish and wildlife moving in interstate or foreign commerce be accurately marked and labeled as to their contents. Second, the Lacey Act makes it unlawful to import, export, transport, sell, receive, acquire, or purchase fish, wildlife, and certain indigenous plants taken, possessed, transported, or sold in violation of state, federal, Indian tribal, or foreign laws or regulations that relate or refer to fish or wildlife or plants. Violators are subject to both criminal and civil sanctions. The prohibitions apply broadly to all wild animals, whether dead or alive, and to any part, product, egg, or offspring, including captive-bred animals, and more narrowly to certain wild plants indigenous to the United States.

Marine Mammal Protection Act of 1972 (MMPA), 16 U.S.C. 1361–1421h

The MMPA generally prohibits taking and importation of all marine mammals, except under limited exceptions. The MMPA gives the Secretary of Commerce authority and duties under the act for all cetaceans (whales, dolphins, and porpoises) and pinnipeds (seals and sea lions, except walruses), and it gives authority for other species of marine mammals to the Secretary of the Interior. It requires the Secretary to prepare and periodically revise stock assessments of marine mammal stocks (MMPA section 117). It requires the secretary to publish in the Federal Register and revise at least annually a list of commercial fisheries that categorizes the fisheries based on the incidence of serious injury and mortality of marine mammals (MMPA section 188(c)). For commercial fisheries categorized as Category I or II (frequent or occasional serious injury or mortality), the Secretary must grant an authorization to incidentally take marine mammals upon receipt of a completed registration form. The secretary is to establish a program to monitor incidental mortality and serious injury of marine mammals during commercial fishing operations (MMPA section 188(d)), which it does through its observer program. The Secretary is to implement a take reduction plan through establishment of a take reduction team for certain “strategic” stocks of marine mammals that interact with Category I or II fisheries to reduce incidental mortality and serious injury of marine mammals from commercial fishing operations (MMPA section 188(f)).

Upon request, and after making certain findings, the secretary is to authorize and prescribe regulations for incidental takes of small amounts of marine mammals (MMPA section 101(a)(5)(A)). In the same manner, the secretary is to issue or deny permits for public display (and maintain an inventory of marine mammals possessed for public display), scientific research, enhancing the survival or recovery of a stock, and educational or commercial photography, after receipt of an application to take marine mammals for those purposes (MMPA section 104). If the secretary receives a petition for a status review of the species (or on the secretary’s own initiative), the secretary is to make a determination whether a species or stock is depleted or is no longer depleted. The secretary is to prepare a conservation plan as soon as possible for any species of stock that the secretary determines is depleted. (MMPA section 115). The secretary is to enforce the provisions of Title I of the MMPA (MMPA section 107).

In consultation with the Secretary of the Interior, Marine Mammal Commission, and others, the Secretary of Commerce is to establish the Marine Mammal Health and Stranding Response Program, including issuing guidance for determining at what point a rehabilitated marine mammal is releasable to the wild and collecting, periodically updated, and making available information related to marine mammal health and strandings (MMPA sections 402 and 403). The secretary is to establish a marine mammal unusual mortality event working group, issue a detailed contingency plan for responding to any unusual mortality event, designate Onsite Coordinators for unusual mortality events, and administer the Marine Mammal Unusual Mortality Event Fund (MMPA sections 404 and 405). The secretary is to maintain a National Marine Mammal Tissue Bank, issue guidance for tissue collection and analysis, and maintain a central database for tissue bank and database (MMPA section 407). The secretary is to conduct the Prescott Marine Mammal Rescue Assistance Grant Program to provide grants to eligible stranding network participants (MMPA section 408).

The secretary has several discretionary duties or areas for which duties can be delegated. The secretary is to prescribe regulations deemed necessary and appropriate related to taking and importing marine mammals and to carry out the purposes of Title I, and the secretary may develop conservation and management measures to alleviate impacts on strategic stocks in certain circumstances (MMPA sections 103, 112(a), and 112(e)). The secretary may by agreement use other Federal agencies or may designate state officers for enforcement of Title I (MMPA section 107 and 109(k)). If a state develops a program that meets statutory requirements for the conservation and management of species of marine mammals,

the secretary is to transfer management authority for the species to the state after certain findings and processes, although there are no states with such authority at this time (MMPA section 109).

Migratory Bird Treaty Act, 16 U.S.C. 703–715s

Under this act, it is unlawful "to pursue, hunt, take, capture, kill, attempt to take... offer for sale, sell, offer to purchase, purchase... any migratory bird... or any part, nest or egg" of any such bird protected by the Migratory Bird Convention, except as permitted by regulations. The Secretary of the Interior is charged with determining when and to what extent these activities may be permitted, and to create regulations for this purpose. Parties wishing to acquire permits for activities otherwise prohibited can do so by submitting an application and meeting specific conditions and requirements. The MBTA also allows for the establishment of fines for violations of provisions, including misdemeanor charges. In addition, states are given the authority to enact stricter regulations for the protection of migratory birds, providing that they are not in conflict with other existing Conventions.

Whaling Convention Act of 1949, 16 U.S.C. 916 – 916l

The Whaling Convention Act of 1949 implements the International Convention for the Regulation of Whaling, signed on December 2, 1946. The President appoints the United States Commissioner to the International Whaling Commission. The Secretary of Commerce is authorized to administer and enforce the act. The act prohibits persons subject to the jurisdiction of the United States to engage in whaling, or shipping, transporting, purchasing, selling, offering for sale, importing, exporting, or possessing whales in violation of the Convention or implementing regulations. The act also has provisions for enforcement of these regulations.

National Wildlife Refuge System, 16 U.S.C. 668dd

This section of law consolidates the authorities relating to the various categories of areas administered by the Secretary of the Interior for the conservation of fish and wildlife by designating all such areas part of the National Wildlife Refuge System (the System). The law prohibits knowingly disturbing, injuring, cutting, burning, removing, destroying, or possessing any real or personal property of the United States, including natural growth, in any area of the system, or taking or possessing any fish, bird, mammal, or other wild animals within any such area without a permit. The secretary may permit areas within the System to be used for hunting, fishing, and public recreation when the secretary determines such uses are compatible with the major purposes for which such areas were established.

Another section of law, 16 U.S.C. 460k, recognizes the mounting public demands for recreational opportunities on areas administered by the Secretary of the Interior for fish and wildlife purposes, including areas within the System. This Section provides that the Secretary may administer such areas as public recreation areas when the Secretary determines that public recreation is an appropriate incidental or secondary use. Such public recreation may be permitted only to the extent that it is not inconsistent with the primary objectives for which the particular area was established.

36 CFR Part 2, Resource Protection, Public Use and Recreation for the Channel Islands National Park

The National Park Service regulations generally prohibit possessing, destroying, injuring, defacing, removing, digging, or disturbing from its natural state living or dead wildlife or fish (or parts or products thereof), paleontological specimens, plants, and mineral resources and prohibits possessing or using a mineral or metal detector, magnetometer, side scan sonar, other metal detecting device or sub-bottom profiler.

State Law

California Endangered Species Act, Fish and Game Code 2050 *et seq.*

The California Endangered Species Act generally parallels the main provisions of the federal ESA and is administered by the CDFG. As stated in Section 2052, it is the policy of CDFG to conserve, protect, restore, and enhance any endangered or threatened species and its habitat and it is the intent, consistent with conserving the species, to acquire lands for habitat for these species. Under Section 2053, projects as proposed should not be approved if they jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of the species, if there are feasible alternatives available consistent with conserving the species or its habitat that would prevent jeopardy. In the event that a particular condition makes these alternatives infeasible, individual projects may be approved if they provide appropriate mitigation and enhancement measures.

5.6 PROTECTION OF HISTORICAL/CULTURAL RESOURCES IN THE MARINE ENVIRONMENT

Federal Law

Abandoned Shipwreck Act (ASA), 43 U.S.C. 2101 *et seq.*

The Abandoned Shipwreck Act asserts United States title to shipwrecks embedded in state submerged lands and transfers title to the state, except when the wreck is located on public or Indian land, or is a U.S. warship that has not been affirmatively abandoned. The public is given notice of the location of any shipwreck when title is asserted under the act.

Pursuant to the act, states manage a broad range of living and nonliving resources in their waters and submerged lands. Shipwrecks protected under the act offer recreational and educational opportunities for divers, tourists, users of biological sanctuaries, and historical researchers. States are encouraged to provide public access to the shipwrecks through the adoption of guidelines for the creation of underwater parks.

The Secretary of the Interior, through the National Park Service, publishes guidelines to maximize the enhancement of shipwrecks as cultural resources; foster a partnership among sport divers, salvors, and other interests to manage shipwreck resources; facilitate access and utilization of the shipwrecks; and recognize the interests of groups engaged in shipwreck discovery and salvage.

Antiquities Act of 1906, 16 U.S.C. 431 *et seq.*

The Antiquities Act has two main components: (1) a criminal enforcement component, which provides for the prosecution of persons who appropriate, excavate, injure, or destroy any historic or prehistoric ruin or monument, or any object of antiquity on lands owned or controlled by the United States; and (2) a component that authorizes, through the issuance of a permit, the examination of ruins, the excavation of archeological sites, and the gathering of objects of antiquity on lands owned or controlled by the United States.

The Antiquities Act has been applied in the marine environment. Where the United States has ownership or control of the submerged lands in or on which submerged cultural resources are located, the Antiquities Act permitting provision can be used to regulate salvage. It appears, however, that its reach may be

limited to regulating salvage only in marine protected areas in which the United States has the authority to protect submerged cultural resources.

Archaeological Resources Protection Act of 1979 (ARPA), 16 U.S.C. 470aa *et seq.*

ARPA is another historic preservation statute that has been applied to the marine environment. ARPA was specifically designed to prevent looting and destruction of archeological resources. Like the Antiquities Act, ARPA has both an enforcement and a permitting component. The enforcement provision provides for the imposition of both criminal and civil penalties against violators of the act. ARPA's permitting component allows for the recovery of certain artifacts consistent with the standards and requirements of the Federal Archeological Program. While ARPA is applicable to the marine environment, its reach in this context is limited. Pursuant to the express language of the act itself, ARPA can only be applied to such areas as national parks (with federally-owned submerged lands) and wildlife refuges. The definition of public lands expressly excludes the outer continental shelf (i.e., federal exclusion or reservations under the Submerged Lands Act).

The purpose of this act is to secure, for the present and future benefit of the American people, the protection of archaeological resources and sites which are on public lands and Indian lands, and to foster increased cooperation and exchange of information between governmental authorities, and professional archaeological community, and private individuals having collections of archaeological resources and data which were obtained before October 31, 1979.

National Marine Sanctuary program-wide regulations provide that "management of historical resources under the National Marine Sanctuaries Act shall be consistent, to the extent practicable, with the Federal Archeological Program by consulting the Uniform Regulations, ARPA (43 CFR part 7) and other relevant Federal regulations" (15 CFR 922.2(e)).

National Historic Preservation Act (NHPA), 16 U.S.C. 470 *et seq.*

NHPA is the largest piece of federal historic preservation legislation. It has two major components that affect the responsibilities of federal agencies managing submerged lands. First, under Section 106 of NHPA, federal agencies are to consider the effects of their undertakings (including the issuance of permits, the expenditure of federal funding and federal projects) on historic resources that are either eligible for listing or are listed on the National Register of Historic Places. Section 110 of NHPA imposes another obligation on federal agencies that own or control historic resources. Under this Section, federal agencies must consider historic preservation of historic resources as part of their management responsibilities.

36 CFR Part 2, Resource Protection, Public Use and Recreation for the Channel Islands National Park

The National Park Service regulations generally prohibit possessing, destroying, injuring, defacing, removing, digging, or disturbing from its natural state living or dead wildlife or fish (or parts or products thereof), paleontological specimens, plants, and mineral resources and prohibits possessing or using a mineral or metal detector, magnetometer, side scan sonar, other metal detecting device or sub-bottom profiler.

Executive Order Number 11593 (1971)

This presidential order extended the protections of the National Historic Preservation Act of 1966 to all properties eligible for inclusion on the National Register of Historic Places and charged the federal agencies providing funds for any project to insure that such protections are afforded.

State Law**California's Native American Resource Protection Act of 2003**, Chapter 1.76, Public Resources Code, Section 5097.993-5097.994

Approved by Governor Davis on September 30, 2002. A summary of the bill's provisions and applicability is as follows:

- Any person who illegally excavates, destroys, injures, or defaces a Native American historic, cultural, or sacred site, including any historic or prehistoric ruins, any burial ground, any archaeological or historic site, any inscriptions made by Native Americans at such a site, any archaeological or historic Native American rock art, or any archaeological or historic feature of a Native American historic, cultural, or sacred site is guilty of a misdemeanor.
- The archaeological or historic site should be listed, or may be eligible for listing, in the California Register of Historic Resources pursuant to Section 5024.1.
- Pertains to public and private land.
- Punishable by imprisonment in a county jail up to one year, by a fine not to exceed ten thousand dollars (\$10,000), or by both that fine and imprisonment.
- Each person who commits this violation is also subject to a civil penalty not to exceed fifty thousand dollars (\$50,000) per violation.
- In determining the civil penalty amount, the court takes into account the extent of the damage to the resource and may consider the commercial or archaeological value of the resource involved and the cost to restore and repair the resource.
- Civil action may be brought by the district attorney, the city attorney, or the Attorney General, or by the Attorney General upon a complaint by the Native American Heritage Commission.
- All monies collected from civil penalties as a result of an enforcement action brought by a city or county, or by the Attorney General for the Native American Heritage Commission, are first utilized to repair or restore the damaged site, and the remaining monies shall be available to that city or county or Attorney General to offset incurred costs.

Title 14 California Administration Code, Section 630(a)(1), General Regulations for Ecological Reserves

No person shall mine or disturb geological formations or archaeological artifacts, or take or disturb any bird, or nests or eggs thereof, or any plant, mammal, fish, mollusk, crustacean, amphibian, reptile, or any other form of plant or animal life except as provided in subsections 630.0 (a)(2) and (a)(8). CDFG may implement enhancement and protective measures to assure proper utilization and maintenance of ecological reserves.

5.7 INTRODUCED SPECIES IN THE MARINE ENVIRONMENT

Federal Regulations

Nonindigenous Aquatic Nuisance Prevention and Control Act, 16 U.S.C. 4701 *et seq.*

The Nonindigenous Aquatic Nuisance Prevention and Control Act, directs the Secretary of the department that houses the USCG (currently the Department of Homeland Security) to issue regulations to prevent the introduction and spread of aquatic nuisance species into the Great Lakes through ballast water. These regulations are to be issued in consultation with the Aquatic Nuisance Task Force, composed, *inter alia*, of the Under Secretary of Commerce for Oceans and Atmosphere, the Director of the USFWS, the Administrator of the U.S. EPA, the Commandant of the USCG, and the Assistant Secretary of Army (Civil Works). Civil and criminal penalties are available for regulatory violations.

The act also requires the task force to implement a prevention, monitoring and control program for aquatic nuisance species in U.S. waters. States can develop comprehensive aquatic nuisance species management plans, which can be implemented with federal grants and financial assistance if the plans are approved by the task force or the Assistant Secretary of the Army (Civil Works).

The act further requires the Departments of Defense and Transportation (now applies to the Department of Homeland Security with regard to USCG vessels) to implement ballast water management programs for seagoing DoD and USCG vessels to minimize risk of introduction of non-indigenous species from releases of ballast water. The act also requires the Departments of the Interior and Commerce to conduct a ballast water management demonstration program to demonstrate preventive technologies and practices.

Carriage of Animals, 46 U.S.C. 3901–3902, provides authority for the Secretary of Agriculture to prescribe regulations governing the accommodations for the export of animals, and provides for penalties for violations of such regulations.

Lacey Act Amendments of 1981, 16 U.S.C. 3371-3378, (see also description above under section 5.1.5) prohibits domestic and international trafficking in and possession of protected fish, wildlife, and plants.

36 CFR Part 2, Resource Protection, Public Use and Recreation for the Channel Islands National Park

National Park Service Regulations in effect at Channel Islands National Park (boundaries of which include San Miguel and Prince Islands, Santa Rosa, Santa Cruz, Anacapa and Santa Barbara Islands, including the rocks, islets, submerged lands, and waters within one nautical mile of each island, 16 U.S.C. 410(ff) prohibit introducing wildlife, fish or plants, including their reproductive bodies, into a park area ecosystem (36 CFR. Part 2 2.1(a)(2)).

State Law

Title 14 CCR 671.1 Importation, Transportation and Possession of Live Restricted Animals.

Provides for the California Department of Fish and Game to issue permits, with conditions, to import, export, transport, maintain, dispose of, or use for any purpose any animal otherwise restricted by regulation, including transgenic aquatic animals.

California Fish and Game Code 15007 prohibits spawning, incubating or cultivating transgenic and exotic species (as defined in the section) in California marine waters (0 to 3 NM offshore).

5.8 OPERATION OF MOTORIZED PERSONAL WATERCRAFT

Federal Law

36 CFR 3.24, Regulation of Personal Watercraft

National Park Service regulations prohibit personal watercraft use in units of the National Park system, including the waters of the Channel Islands National Park.

5.9 OTHER FEDERAL AND STATE LAWS

There are other existing applicable federal and state laws that do not fall within the nine regulatory categories listed above. They are listed below under the following five sub-categories:

- Sustainability or Sustainable Development of Biological Resources
- Marine Environmental Quality
- Tourism and Recreation
- U.S. Marine Transportation
- Lightering
- Cross-cutting Federal Law

5.9.1 Sustainability or Sustainable Development of Biological Resources

Federal Law

Anadromous Fish Conservation Act, 16 U.S.C. 757a–757g

The Anadromous Fish Conservation Act provides authority to enter into cooperative agreements to conserve, develop, and enhance anadromous fish resources, including conducting research and investigations, stream clearances, and constructing and maintaining devices to assist with feeding, spawning, and migration. The act authorizes the Secretary of the Interior to enter into cooperative agreements with one or more states for the purpose of conserving, developing, and enhancing anadromous fish resources and the fish in the Great Lakes and Lake Champlain that ascend streams to spawn.

Control or Elimination of Jellyfish or Sea Nettles, 16 U.S.C. 1201–1205

The Secretary of Commerce is authorized to cooperate with, and provide assistance to, the states in controlling and eliminating jellyfish and other such pests and in conducting research for the purposes of controlling floating seaweed. Congress also consents to any compact or agreement between any two or more states for the purpose of carrying out a program of research, study, investigation, and control of jellyfish and other such pests in the coastal waters of the United States.

Driftnet Impact Monitoring, Assessment and Control Act, 16 U.S.C. 1822 note

The Secretary of Commerce, through the Secretary of State is required to seek to secure international agreements to implement an international ban on large-scale driftnet fishing. The Secretary of Commerce,

after consultation with the Secretary of State and the Secretary of the department in which the Coast Guard is operating (currently the Department of Homeland Security), must submit a periodic report to Congress describing the steps taken to carry out the act. If the Secretary of Commerce determines that such driftnet fishing “diminishes the effectiveness” of an international fishery conservation program, or if the Secretary of Commerce or the Interior determines that such driftnet fishing results in taking which “diminishes the effectiveness” of any international program for endangered or threatened species, the secretary making such finding shall certify such fact to the President pursuant to the Pelly Amendment, 22 U.S.C 1978.

Eastern Pacific Tuna Licensing Act of 1984, 16 U.S.C. 972–972h

The Eastern Pacific Tuna Licensing Act of 1984 implements the Eastern Pacific Ocean Tuna Fishing Agreement, signed in San Jose, Costa Rica, on March 15, 1983. The Secretary of State is authorized to act on behalf of the United States and appoint a United States representative to the representative body. The Secretary of Commerce, in cooperation with the Secretary of State and the Secretary of the department in which the Coast Guard is operating, promulgates necessary regulations. The act provides for enforcement of the act and its implementing regulations.

Fish and Wildlife Act of 1956 and associated provisions, 16 U.S.C. 742a–742d, 742e–742j, 742k, 744–748, 750–753, 753a–753b, 754, 758–758d, 760a–760g.

The Fish and Wildlife Act of 1956, among other things, authorizes NOAA’s National Marine Fisheries Service (NMFS) to conduct investigations and prepare and disseminate information and reports regarding fish and their habitats in order to provide for the proposed development of fish resources.

Fish and Wildlife Coordination Act, 16 U.S.C. 661–666c

The Fish and Wildlife Coordination Act requires that wildlife conservation receive equal consideration with other features of water-resource development. The act requires that federal permitting and licensing agencies consult with NMFS and the USFWS before issuing a permit or license for activities that modify any body of water. NMFS provides comments and recommendations to prevent loss of, and damage to, fish populations and their habitats.

Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801–1883

Under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), the United States claimed sovereign rights and exclusive fishery management authority over all fish, and all Continental Shelf fishery resources, within the EEZ. The MSFCMA establishes a procedure for authorizing foreign fishing and prohibits unauthorized foreign fishing within the EEZ.

The MSFCMA establishes national standards for fishery conservation and management within the EEZ. The FCMA established eight Regional Fishery Management Councils each composed of the principal state official with fishery management responsibility, the relevant regional administrator of NMFS, and individuals appointed by the Secretary of Commerce who are knowledgeable regarding the conservation and management, or the commercial or recreational harvest, of the fishery resources of the geographical area concerned. The Councils are responsible for preparing and amending fishery management plans for each fishery under their authority that requires conservation and management.

Fishery management plans describe the fisheries and contain necessary and appropriate conservation and management measures, applicable to foreign fishing and fishing by vessels of the United States. The plans are submitted to the Secretary of Commerce for approval. If approved, the Secretary of Commerce promulgates implementing regulations. The Secretary of Commerce may prepare Secretarial fishery management plans if the appropriate council fails to develop such a plan. The MSFCMA also provides for enforcement of the act.

The National Aquaculture Act of 1980, 16 U.S.C. 2801–2810

The purpose of the National Aquaculture Act of 1980 is to promote aquaculture in the United States. The Secretaries of Agriculture, Commerce, and the Interior are required to establish and periodically amend a National Aquaculture Development Plan. The secretaries are required to submit a biennial report to Congress that contains a description and evaluation of the actions undertaken with respect to the plan. The secretaries are to provide information and assistance on aquaculture activities.

The National Fishing Enhancement Act of 1984 (Artificial Reefs), 16 U.S.C. 1220, 33 U.S.C. 2101 *et seq.*

The National Fishing Enhancement Act was enacted to promote and facilitate the establishment of artificial reefs. The Secretary of Commerce, in consultation with Secretaries of the Interior and Defense, the Secretary of the Department in which the Coast Guard is operating, the Administrator of the Environmental Protection Agency, Regional Fishery Management Councils, States, Interstate Fishery Commissions and individuals, shall develop and publish a long-term plan which must include geographic, hydrographic, biological, ecological, social, economic, design, material, and other criteria for artificial reef construction; mechanism for monitoring compliance with permit requirements and managing use of the reefs; synopsis of existing information on artificial reefs and needs for further research; and an evaluation of alternatives for facilitating transfer of artificial reef construction materials to person holding permits.

The Secretary of the Army will issue permits for construction of artificial reefs and will notify the Secretary of Commerce of any need to deviate from the Commerce long-term plan.

5.9.2 Marine Environmental Quality

Federal Law

Clean Air Act (CAA), 42 U.S.C. 7401 *et seq.*

The CAA is divided into six principal subchapters. Subchapter I addresses air pollution from stationary sources and requirements for states to develop plans to meet health-based standards. (Also, subchapters IV-A, V, and VI deal with specific stationary source programs.) Part A of subchapter I contains the basic provisions to control air pollution from stationary sources. Based on statutory criteria, the U.S. EPA is required to list criteria pollutants and, for each such pollutant, establish primary and secondary National Ambient Air Quality Standards (NAAQSs). Each state (or U.S. EPA, if the state declines) must submit to U.S. EPA a state implementation plan with individual emission limitations and procedures to ensure timely attainment of the NAAQSs for each air quality region within the state.

Part A also includes, among other things, key specialized stationary source programs. For example, U.S. EPA must adopt emission standards for categories of hazardous air pollutants (HAPs) in accordance with a specified schedule. (HAPs are listed in the statute.) Section 112(m) of the CAA directs U.S. EPA, in cooperation with the NOAA, to assess the extent of atmospheric deposition of HAPs (and, in the discretion of U.S. EPA, other air pollutants) to the Great Lakes, Chesapeake Bay, Lake Champlain and coastal waters (defined, for purposes of the subsection, as estuaries under the National Estuary Program and National Estuarine Research Reserves). The assessment program is to, among other things, establish a monitoring network, investigate sources and deposition rates, evaluate any adverse effects to public health or the environment, and assess the contribution of such deposition to violations of water quality standards established pursuant to the Clean Water Act. U.S. EPA is to submit biennial reports to Congress on the matter and issue a determination as to whether the other provisions of Section 112 are adequate to prevent serious adverse effects to public health and serious or widespread environmental effects associated with HAP deposition. If U.S. EPA determines that the authorities of Section 112 are not adequate, the agency

is directed to promulgate such further emission standards or control measures under Section 112 as may be necessary and appropriate.

Part B of Subchapter I is repealed; Part C addresses the "prevention of significant deterioration" program, designed to limit the deterioration of air quality in regions with air cleaner than the minimum federal air quality standards. Part D addresses plan requirements for non-attainment areas.

Subchapter II addresses emission standards for moving sources. Subchapter III addresses administration and enforcement. Amendments to Subchapter III made in 1990 require U.S. EPA, following consultation with the Department of the Interior and the U.S. Coast Guard, to establish regulatory requirements to control air pollution from OCS sources (except in the Gulf of Mexico, over which the Department of the Interior has jurisdiction). Subchapter IV-A addresses acid deposition. This subchapter was added in 1990 to reduce emissions of pollutants, primarily sulfur dioxide and nitrogen dioxide, leading to the formation of acid precipitation. Subchapter V addresses permits, requiring each state to submit to U.S. EPA for approval a permit program covering basically every pollution source subject to the CAA. If a state fails to submit and implement an approved program, U.S. EPA is to step in. Subchapter VI addresses stratospheric ozone depletion. The CAA also establishes a great waters program, which looks specifically at the impacts of air deposition of nutrients and toxics in coastal waters.

Coastal Zone Management Act of 1972 (CZMA), 16 U.S.C. 1451 *et seq.*

The CZMA strives to preserve and protect coastal zone resources. Also, through the CZMA, states are encouraged to develop coastal zone management programs (CZMPs) that allow economic growth compatible with the protection of natural resources, the reduction of coastal hazards, the improvement of water quality, and sensible coastal development. The CZMA provides financial and technical incentives for coastal states to manage their coastal zones consistent with CZMA standards and goals.

State coastal zones include the coastal waters and adjacent shorelands that extend inland to the extent necessary to control shorelands, the use of which have a direct and significant impact on coastal waters and to control those geographical areas likely to be affected by or vulnerable to sea level rise. For federal approval, a CZMP must: (1) identify the coastal zone boundaries; (2) define the permissible land and water uses within the coastal zone that have a direct and significant impact and identify the state's legal authority to regulate these uses; (3) inventory and designate areas of particular concern; (4) provide a planning process for energy facilities; (5) establish a planning process to control and decrease shoreline erosion; and (6) facilitate effective coordination and consultation between regional, state, and local agencies. NOAA grants the requisite federal approvals for CZMPs and oversees subsequent implementation of the programs.

A state with a federally approved CZMP is eligible for financial assistance and gains a legal mechanism to control federal permits and activities that affect the state's coastal zone. Federal agency activities that affect any land or water use or natural resource of the coastal zone must be consistent to the maximum extent practicable with the enforceable policies of the state CZMP. Federally licensed or permitted activities that affect any land or water use or natural resource of the coastal zone must be consistent with the enforceable policies of the CZMP. The Secretary, however, can override a state's determination of inconsistency if the Secretary finds that the federally licensed or permitted activity is consistent with the objectives of the CZMA or is otherwise necessary in the interest of national security.

The CZMA establishes the National Estuarine Research Reserve System (NERR). States may seek Federal approval and designation of certain areas as NERRs if the areas qualify as biogeographic and typological representations of estuarine ecosystems and are suitable for long-term research and

conservation. Once an area is designated as a NERR, federal financial assistance is available for acquisition of property and management, research, and education related to the NERR.

See also Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990.

National Coastal Monitoring Act, 33 U.S.C. 2801 *et seq.*

The National Coastal Monitoring Act, also known as title V of the Marine Protection, Research, and Sanctuaries Act of 1972, provides joint authority for the U.S. EPA and NOAA to establish a comprehensive national program for consistent monitoring of the nation's coastal ecosystems. The act provides that the program is to include, but is not limited to: identification and analysis of the status of environmental quality in the nation's coastal ecosystems (including, but not limited to, assessment of ambient water quality, benthic environmental quality, and health and quality of living resources); identification of sources of environmental degradation affecting the nation's coastal ecosystems; assessment of the impact of governmental programs and management strategies and measures designed to abate or prevent the environmental degradation of the nation's coastal ecosystems; assessment of the accumulation of floatables along coastal shorelines; analysis of short-term and long-term trends in the environmental quality of the nation's coastal ecosystems; and the development and implementation of intensive coastal water quality monitoring programs (after designation of intensive coastal monitoring areas).

National Contaminated Sediment Assessment and Management Act, 33 U.S.C. 1271

Section 1271 of the National Contaminated Sediment Assessment and Management Act requires the U.S. EPA, in consultation with NOAA and the Department of the Army, to conduct a comprehensive national survey of data regarding sediment quality and a continuing program to assess such quality.

National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 *et seq.*

NEPA requires, among other things, that for every major federal action significantly affecting the quality of the human environment, the agency prepare a detailed statement regarding:

- (i) the environmental impact of the proposed action;
- (ii) any adverse environmental effects that cannot be avoided should the proposal be implemented;
- (iii) alternatives to the proposed action;
- (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and
- (v) any irreversible and irretrievable commitments of resources that would be involved in the proposed action should it be implemented.

This document is called an EIS. It is, in essence, a detailed discussion of the environmental consequences of a given proposed agency action, and it must be made available to the agency decision-maker on the matter, the public, and other agencies.

Under the regulations implementing NEPA, a document called an environmental assessment is used to determine whether a federal action rises to the level of a "major federal action significantly affecting the quality of the human environment," thus triggering the requirement to prepare an EIS. Based on the environmental assessment, if an action does not rise to that level, a Finding of No Significant Impact is made.

Title IV of the Marine Protection, Research, and Sanctuaries Act of 1972, 16 U.S.C. 1447a to 1447f

The purpose of Title IV of the Marine Protection, Research, and Sanctuaries Act of 1972, is to establish regional research programs, under effective federal oversight, to: (1) set priorities for regional marine and coastal research in support of efforts to safeguard the water quality and ecosystem health of each region;

and (2) carry out such research through grants and improved coordination. The regions are: the Gulf of Maine, greater New York bight, mid-Atlantic, South Atlantic, Gulf of Mexico, California, North Pacific, Alaska, and insular Pacific.

Specifically, a regional marine research board is to be established for each region, consisting of eleven members -- three appointed by NOAA, two by the U.S. EPA, and six by governors of states located within the region. Each board is to develop and submit to NOAA and U.S. EPA for approval a comprehensive marine research plan for the region, to be updated at least every four years. Each board is also to: (1) provide a forum for coordinating research among research institutions and agencies, (2) provide for review and comment on its research plan by affected users and interests, (3) ensure that the highest quality of research projects will be conducted to carry out the plan, and (4) prepare, for transmittal to Congress by NOAA and U.S. EPA, a periodic report on the marine environmental research issues and activities within the region.

Each marine research plan is to include: (1) an overview of the environmental quality conditions in the coastal and marine waters of the region and expected trends in these conditions; (2) a comprehensive inventory and description of all marine research related to water quality and ecosystem health expected to be conducted during the four-year term of the plan; (3) a statement and explanation of the marine research needs and priorities applicable to the marine and coastal waters of the region over the upcoming ten-year period with emphasis on the upcoming three-to-five-year period; (4) an assessment of how the plan will incorporate existing marine, coastal, and estuarine research and management in the region; and (5) a general description of marine research and monitoring objectives and timetables for achievement through the funding of projects under this title so as to meet the priorities specified in the plan in accordance with item (3) above.

Each board may annually submit a grant application to NOAA to fund projects aimed at achieving the research priorities set forth in the relevant research plan. The title provides that the boards shall cease to exist on October 1, 1999, unless extended by Congress. Authorization of appropriations for the title expired at the end of fiscal year 1996.

Water Resources Development acts, 33 U.S.C. 2280 *et seq.*, *inter alia*

Among other things related to the USACE, the implementing regulations for the Water Resources Development acts require mitigation for damages to fish and wildlife resources resulting from water resource projects.

State Law

California Coastal Zone Management Program, as amended January 1988 (California Public Resources Code, Division 20—California Coastal Act), and the establishment therein of the California Coastal Zone, have been approved by NOAA. This gives the California Coastal Commission consistency authority over coastal projects undertaken by federal agencies.

The California Coastal Commission implements the policies of the California Coastal Act. According to Section 30236, any substantial alteration of rivers or streams shall incorporate the best mitigation measures feasible, and be limited to one of three things: flood control projects where no other method for protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety or to protect existing development. This act also requires protecting environmentally sensitive habitat against any significant disruption of habitat values; only uses dependent on those resources are allowed within those areas (Section 30240a).

The Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) deals with chemicals and substances determined by California to cause cancer or reproductive toxicity. The regulations and a list of chemicals/substances involved are published in Division 2 of Title 22 beginning with Section 12000 of the CCR. It is also published in Title 26, which contains the regulations on toxic substances.

5.9.3 Tourism and Recreation

Federal Law

National Park Service Organic Act, 16 U.S.C. 1, *et seq.*

This act creates the National Park Service (NPS) in the Department of the Interior. The NPS is charged with promoting and regulating the use of federal areas known as national parks, monuments, and reservations. Such areas are established by Congress through specific legislation.

5.9.4 United States Marine Transportation

Federal Law

Coast and Geodetic Survey Act, 33 U.S.C. 883a–k

The Secretary of Commerce is authorized to conduct hydrographic and topographic surveys, tide and current observations, geodetic-control surveys, field surveys for aeronautical charts, and geomagnetic, seismological, gravity, and related geophysical measurements to provide nautical and aeronautical charts and other information for safe marine and air navigation. Also, these charts and information have commercial and industrial uses and fulfill engineering and scientific purposes. This information is collected, assimilated, and distributed by the NOAA under its authority in the act.

International Regulations for Preventing Collisions at Sea, (72 COLREGS), 33 U.S.C. 1051- 1053, 1061-1094

The International Regulations for Preventing Collisions at Sea provides binding comprehensive regulations for the prevention of collisions on the water. The 72 COLREGS apply beyond established demarcation lines. In the United States, the 72 COLREGS govern ship navigation on non-internal waters. The scope of the 72 COLREGS include Steering and Sailing Rules, e.g., conduct of vessels in sight of one another, conduct of vessels in restricted visibility; Lights and Shapes, and Sound and Light Signals. The statute also contains special provisions for ships of war, vessels proceeding under convoy, and fishing vessels engaged in fishing as a fleet. Civil penalties may be assessed for violations of the 72 COLREGS.

46 U.S.C.

Title 46 of the United States Code is integral to maritime transportation as it comprehensively addresses shipping. Title 46 is broken down into three general subtitles:

(I) General; (II) Vessels and Seamen; and (III) Maritime Liability. Subtitle II contains laws governing vessels, cargo and passengers including, for example, laws pertaining to design and construction of vessels, vessel manning and pilotage, and carriage of cargo or passengers.

Part B (Chapters 31 through 47) provides authority and responsibility for the inspection and regulation of vessels by the USCG. Part B specifies vessels subject to inspection and inspection procedures, as well as vessels exempt from inspection.

3201-3205: Management of Vessels; requires the Secretary to prescribe regulations which establish a safety management system addressing, for example, safety and environmental protection, and procedures for safe operation of vessels in compliance with U.S. and international law, for responsible vessels and persons subject to the chapter. The Secretary is to issue Safety Management Certificates and a Document of Compliance to requesters complying with safety management plans.

4301-4311: Recreational Vessels; contains the laws applicable to recreational vessels. The Secretary is authorized to issue regulations establishing, for example, minimum safety and equipment standards (Section 4302; regulations are found in 19 CFR, 33 CFR, 46 CFR). The chapter expressly preempts state law establishment of a recreational vessel or associated equipment performance or other safety standard that is not identical to regulations under Section 4302 (Section 4306).

Interstate Commerce Act, 49 U.S.C. 10101 *et seq.*, *inter alia*

The Interstate Commerce Act provides for the regulation of rates and services of competing interstate carriers. Part B (chapters 131–149) addresses water carriers, defined as a person providing water transportation for compensation (Section 13102(22)). The transportation policy of part B is to "ensure the development, coordination, and preservation of a transportation system that meets the transportation needs of the United States." In overseeing the modes of transportation, the United States will, among other things, recognize and preserve the inherent advantage of each mode of transportation; promote safe, adequate, economical, and efficient transportation; encourage the establishment and maintenance of reasonable rates for transportation, without unreasonable discrimination or unfair or destructive competitive practices; and in overseeing transportation by water carrier, to encourage and promote service and price competition in the noncontiguous domestic trade (Section 13101). The Secretary and the Surface Transportation Board (formerly the Interstate Commerce Commission) have jurisdiction over transportation by water carrier Section 13521).

Intermodal Surface Transportation Efficiency Act of 1991, P.L. 102–240, *inter alia*

The purpose of the act is to develop a national surface transportation system that is economically efficient and environmentally sound, provides the foundation for a global economy, and that will move people and goods in an energy efficient manner. The act provides that the system will consist of all forms of transportation in a unified, interconnected manner, including transportation systems of the future, to reduce energy and air pollution while promoting economic development and supporting the national preeminent position in interstate commerce.

Merchant Marine Acts

Merchant Marine Act of 1920, 46 U.S.C. 861, *inter alia*

Merchant Marine Act of 1928, 46 U.S.C. 866, *inter alia*

Merchant Marine Act of 1936, 46 U.S.C. 1101, *inter alia*

The Merchant Marine Acts sought to promote the continued development of the American Merchant Marine. The purpose as stated in the Act of 1920 is that it is necessary for the national defense and proper growth of foreign and domestic commerce that the United States shall have a merchant marine of the best equipped and most suitable types of vessels sufficient to carry the greater portion of its commerce and serve as a naval or military auxiliary in time of war or national emergency, ultimately to be owned by U.S. citizens (Section 861). The Act of 1928 provided the Secretary of Transportation authority to remodel and improve the fleet. The Act of 1936 sought to foster continued development and maintenance of the merchant marine. The Act also prevents unjust discrimination by carriers.

Shipping Acts

Shipping Act of 1916, 46 U.S.C. 801 *et seq.*

Shipping Act of 1984, 46 App. U.S.C. 1701–1720, *inter alia*

The Shipping Acts are intended to establish a non-discriminatory regulatory process for the common carriage of goods by water in the commerce of the United States. The Shipping Acts were modeled on the Interstate Commerce Act. The Act of 1916 governs transportation by water of passengers and property on the high seas or Great Lakes between states, territories, districts or possessions. Carriers are required to establish and file "joint and reasonable rates" with the Federal Maritime Commission. The Act of 1984 governs foreign commerce (repealing provisions of the Act of 1916 re: foreign commerce), and has as its purposes: to establish a non-discriminatory regulatory process for the common carriage of goods by water in foreign commerce of the United States; to provide efficient and economic transportation system in the ocean commerce of the United States, that is responsive and in harmony to international shipping practices; and to encourage development of an economically sound and efficient United States flag liner fleet capable of meeting national security needs. The act allows ocean carriers the right to establish intermodal or through rates in agreements that must be filed with the Federal Maritime Commission.

Admiralty Extension Act (AEA), 46 U.S.C. 740

The AEA expressly defines the scope of admiralty and maritime jurisdiction of the United States. Such jurisdiction included all cases of damage or injury to person or property, caused by a vessel on navigable water, notwithstanding that such damage or injury be done or consummated on land. Suits under the AEA may be brought *in rem* or *in personam*. However, the AEA provides that any suit brought against the U.S. under the Public Vessels Act (see below) or Suits in Admiralty Act (see below) shall constitute the exclusive remedy, for all suits not otherwise filed under the Federal Torts Claim Act. The AEA was enacted to eliminate the confusion over the lines between land and water, e.g., those cases where persons or property on land was damaged by ships.

Public Vessels Act, (PVA), 46 U.S.C. 781–790

The PVA provides authority for bringing an admiralty cause of action against the United States for damages caused by U.S. public vessels. Thus, the PVA waives sovereign immunity by the United States in cases involving public vessels. Public vessel is not defined in the PVA, but case law provides direction. The PVA contains provisions for the venue of suits brought thereunder, counterclaims, suits by nationals of foreign governments, and exemptions and limitations of liability. The PVA also expressly provides it shall not be construed to recognize the existence of or as creating a lien against any United States public vessel.

Suits in Admiralty Act, as amended (SAA), 46 U.S.C. 741–752

The SAA provides the authority to bring admiralty suits against the United States. Such suits may be brought *in personam*, and no United States vessel or cargo may be seized under the SAA. If a suit is brought under the SAA, it is the exclusive remedy available to a claimant. The SAA provides a statute of limitations (2 years) after the cause of action arises. The United States is entitled to all exemptions and all limitations of liability accorded by law to owners, charterers, operators or agents of vessels. The SAA also provides procedures in the event a vessel within the scope of the SAA is seized by foreign jurisdictions. The SAA authorizes arbitration, compromise, or settlement of claims. The SAA also provides that a crew of a United State vessel may recover compensation for salvage services. Finally, any money recovered by a suit brought by the United States shall be deposited in the U.S. Treasury to the credit of the department having control of the vessel or cargo with respect to such cause of action.

5.9.5 Lightering

Federal Law

33 CFR Part 156 Oil and Hazardous Material Transfer Operations These regulations provide comprehensive requirements for all oil transfer operations. The regulations provide requirements that

address such matters as: the designated person in charge of transfer operations, advance notice to the Coast Guard about planned transfer operations, certain conditions and equipment requirements that must be met before the transfer operations may begin, communications between all parties involved in the transfer, discharge containment and reporting procedures, transfer monitoring equipment, procedures for discharge cleanup, procedures regarding the declaration of inspection that must be completed prior to transfer operations, required and prohibited conduct by personnel during the transfer operation, and equipment tests and inspections. The regulations also provide certain requirements that apply specifically to lightering operations, such as: 24 hour advance “pre-arrival” notices of plans to conduct lightering and detailed and comprehensive information about the vessels involved and the planned lightering operation; 72 hour advance notice of the need for Tank Vessel Examinations (where appropriate); immediate reporting if fire, explosion, collision, grounding or any similar emergency, which poses a threat to the vessels involved, occurs during lightering; and reporting on any discharge that occurs during lightering operations. The regulations also provide the requirements and procedures for designating lightering zones and explain that in geographic areas in which lightering zones have been designated, no lightering may occur outside of the designated zones. To date four lightering zones have been designated in the U.S. and all four are located within the Gulf of Mexico.

State Law

Title 14, California Code of Regulations 840 – 845.2 California regulations provide comprehensive requirements for all oil transfer operations within or that may have an effect on marine waters of the State. The regulations stipulate that no vessel may transfer cargo oil upon marine waters of the State where the cargo oil is to be lightered, unless the vessel meets all of the general oil transfer requirements, both the transfer and receiving vessel have on board certain certificates/letters and an International Oil Pollution Prevention certificate (or equivalent) at the time of transfer. The general regulations provide requirements at every phase of lightering operations: pre-transfer, during transfer, and following transfer operations. The regulations require that: certain conditions be met in order for transfer operations to occur, communications be maintained between parties involved in the transfer, certain containment and response equipment and spill cleanup equipment, reports, and designation of and qualifications for parties in charge of transfer operations.

5.9.6 Cross-cutting Federal Law

Federal Law

National Marine Sanctuaries Act (NMSA), 16 U.S.C. 1431 *et seq.*, also known as title III of the Marine Protection, Research, and Sanctuaries Act of 1972. The NMSA provides the Secretary of Commerce with the authority to designate and manage marine areas of special national significance as National Marine Sanctuaries. The NMSA lists conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, and esthetic as qualities that might give an area special national significance. The NMSA's purposes and policies include comprehensive and coordinated conservation and management; maintaining natural biological communities and, where appropriate, restoring and enhancing natural habitats, populations, and ecological processes; enhancing public awareness, understanding and appreciation of the marine environment; and facilitating, to the extent compatible with the primary objective of resource protection, all public and private uses of resources not prohibited pursuant to other authorities.

Among the factors the Secretary must consider in determining whether an area merits designation as a National Marine Sanctuary are present and potential uses of the area that depend on maintenance of the area's resources, including commercial and recreational fishing, other commercial and recreational

activities, and research and education and the public benefits to be derived from sanctuary status, with emphasis on the benefits of long-term protection of nationally significant resources, vital habitats, and resources which generate tourism.

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7 PERSONS AND AGENCIES CONTACTED

7.0 PERSONS AND AGENCIES CONTACTED

Agencies and Elected Officials Receiving Consultation Letters, May 2003

United States Senate

The Honorable Barbara Boxer
The Honorable Diane Feinstein

United States House of Representatives

The Honorable Lois Capps
The Honorable Elton Gallegly

Federal Committees

Senate Committee on Commerce, Science, and Transportation
The Honorable Ernest F. Hollings, Chair (former)

House Resources Committee
The Honorable Richard Pombo, Chair

Department of Energy

Andrew C. Lawrence
Deputy Assistant Secretary, Office of Environmental Policy and Guidance

Department of Transportation

Sean B. O'Hollaren
Assistant Secretary for Governmental Affairs (former)

Federal Aviation Administration

Patricia G. Smith, Associate Administrator
Office of Commercial Space Transportation

Department of the Interior

Dr. Willie R. Taylor, Director
Office of Environmental Policy and Compliance

U.S. Fish and Wildlife Service

Anne Badgley
Regional Director, Pacific Region (former)

Minerals Management Service

J. Lisle Reed
Regional Director, Pacific OCS Region

National Park Service

John J. Reynolds
Director, Pacific West Region (former)

Channel Islands National Park
Terry Hofstra
Acting Superintendent (former)

Environmental Protection Agency
Diane Regas
Director, Office of Ocean, Wetlands, and Watersheds

Department of State
Mary Beth West
Deputy Assistant Secretary for Oceans and Fisheries (former)

Department of Defense
John Paul Woodley, Jr.
Assistant Deputy Under Secretary for Defense for Environment (former)

US Navy
Donald Schregardus
Deputy Assistant Secretary of the Navy (Environment)

US Air Force
Maureen T. Koetz,
Deputy Assistant Secretary of the Air Force
(Environment, Safety and Occupational Health)

National Aeronautics and Space Administration
Olga Dominguez
Director, Environmental Management Division (former)

Ames Research Center (NASA)
G. Scott Hubbard, Center Director

United States Coast Guard
Admiral Ryan Stumpp
Commander, 11th Coast Guard District (former)

Commander J.E. Frost
Chief, Law Enforcement Division
11th Coast Guard District

NOAA-National Marine Fisheries Service
Dr. Rebecca Lent, Deputy Assistant Administrator (former)

NOAA National Environmental Satellite, Data, and Information Service
Gregory W. Withee
Assistant Administrator

NOAA National Environmental Satellite, Data, and Information Service
Michael Mignogno
Polar Operational Satellite Program Manager

Pacific Fishery Management Council

Dr. Donald McIsaac
Executive Director

California Resources Agency

Mary D. Nichols, Secretary (former)

CA Department of Fish and Game

Robert C. Hight, Director (former)

CA Department of Water Resources

Thomas M. Hannigan, Director (former)

CA State Lands Commission

Paul D. Thayer, Executive Officer

CA Fish and Game Commission

Robert Treanor, Executive Director

CA Department of Boating & Waterways

Raynor T. Tsuneyoshi, Director

CA Department of Conservation

Darryl W. Young, Director

California Coastal Commission

Peter Douglas, Executive Director

Governor, State of California

The Honorable Gray Davis (former)

California EPA

Winston Hickox, Secretary (former)

California State Water Resources Control Board

Arthur G. Baggett, Jr., Chair

Ventura County Executive Office

John F. Johnston, Executive Officer

County of Ventura Harbor Dept.

Lyn Krieger, Department Director

County of Santa Barbara

Naomi Schwartz

Chair, Board of Supervisors (former)

County of Santa Barbara

Rob Almy, Water Agency Manager

County of Santa Barbara
Dianne Meester
Assistant Director, Planning and Development

Municipal Entities

City of Santa Barbara
Mayor Marty Blum

City of Santa Barbara
John N. Bridley, Waterfront Director

City of Santa Barbara
Mick Kronman, Harbor Operations Manager

Ventura Port District
Oscar Peña, General Manager

Port of Hueneme/Oxnard Harbor District
William J. Buenger, Executive Director

Sanctuary Advisory Council Representatives/Affiliations, 1999-2004

Agosta, William - Agosta International Marine
Ainsworth, Jack – California Coastal Commission
Akins, Leah – California Resources Agency
Auerbach, Jeff - Jewish League of Environmental Awareness
Baird, Brian – California Resources Agency
Baker, Monica – Island Packers, Inc.
Baker, Lauri – Hotel Sales and Marketing, Santa Barbara
Barminski, Joan – Minerals Management Service
Barsky, Kristine – California Department of Fish and Game
Adam, Birst – U.S. Coast Guard
Brodie, Alex – Island Packers, Inc.
Brumbaugh, Dan – American Museum of Natural History
Brye, Jim – Ventura Yacht Club
Cabugos, Paulette – Chumash Maritime Association
Caesar, Darren – Talbot/Caesar and Seider Insurance Services, LLC
Cahn, Matthew – California State University, Northridge
Campbell, Jackie – Santa Barbara County
Clark, Jon – Wendy P. McCaw Foundation
Cordero, Roberta – Chumash Maritime Association
Cousteau, Jean-Michel – Ocean Futures Society
Daily, Marla – Santa Cruz Island Foundation
Davis, Gary – National Park Service
deWet-Oleson, Kathy – Ocean videographer, Ventura CA
Dow, Ron – U.S. Navy
Duncan, Robert – Paine Webber
Dunn, W. Scott - Adventours Outdoor Excursions

Dusette, Don – Channel Islands Pipeline, Inc.
Enriquez, Lyle – National Marine Fisheries Service
Fahy, Christina – National Marine Fisheries Service
Finucan, Michael – Hornet Sportfishing
Fitzgerald, Jack – Channel Islands National Park
Fusaro, Craig – Joint Oil/Fisheries Liaison Office
Galipeau, Russell – Channel Islands National Park
Gibbs, Tony – Islands Magazine
Glaser, Warren – Naturalist, Ventura CA
Graves, Yuri – U.S. Coast Guard
Grifman, Phyllis – Sea Grant, university of Southern California
Gross, Jorge – California Department of Fish and Game
Guerra, Avie – Oxnard, CA
Hamerski, Michael – U.S. Coast Guard
Hanrahan, Michael – The Ocean Channel, Inc.
Helms, Greg – The Ocean Conservancy
Helvey, Mark – National Marine Fisheries Service
Hoeflinger, Chris – Ventura County Commercial Fishermen’s Association
Holt, Richard – Ventura, CA
Hooper, Eric – Commercial Fisherman, Ventura CA
Howorth, Peter – Marine Mammal Center, Santa Barbara CA
Johnson, Korie – National Marine Fisheries Service
Kendig, Bill – Sport Chalet, Ventura CA
Kett, Eric – Sea Zen Marine Consulting (former)
Knowlton, Jim – Ocean Futures Society
Krieger, Lyn – Ventura County Harbor Department
Kronman, Mick – Santa Barbara Harbor
Krop, Linda – Environmental Defense Center
LaCorte, Barbara – Hope School, Santa Barbara
Liquornik, Harry – Commercial Fishermen of Santa Barbara, Inc.
Lohuis, Holly – Ocean Futures
Long, Dave – Cabrillo High School
Lum, Matthew - MJL Advisors, Inc.
Luzader, John – U.S. Coast Guard
Manson, Larry – Ventura College
Marshall, Jim – Commercial Fisherman, Santa Barbara CA
Mayerson, Drew – Minerals Management Service
McCrea, Merit – SeaHawk Sportfishing Charters (former), Santa Barbara CA
Meester, Dianne – Santa Barbara County
Melendez, Ricardo – Candelaria American Indian Council
Mertes, Leal – University of California, Geography Department
Miller, Chris – California Lobster and Trap Fishermen’s Association
Miller-Henson, Melissa – California Resources Agency
Peveler, Jack – Ventura County Harbor Department
Piltz, Fred – Minerals Management Service
Pringle, Gail – U.S. Navy
Rentz, Troy – U.S. Coast Guard
Roberson, Stephen - Graves, Roberson & Bourassa
Roth, Rebecca – California Coastal Commission
Russell, J. Wade – U.S. Coast Guard

Schobel, Walt – U.S. Air Force
Schuyler, Jr., Arent H. – Santa Barbara Maritime Museum
Scott, Rudy – Jordanos, Inc.
Secord, Dan S – Santa Barbara City Council
Setnicka, Tim – National Park Service (former)
Shevock, Jim – National Park Service
Sorrell, Rick – U.S. Coast Guard
Spicer, William – Western Gate Publishing
Steele, Bruce – Commercial Fisherman, Santa Barbara CA
Stone, Alex – U.S. Navy
Taylor, Craig – Santa Barbara, CA
Timm, Gary – California Coastal Commission
Ugoretz, John – California Department of Fish and Game
Vojkovich, Marija – California Department of Fish and Game
Warner, Robert – University of California, Department of Ecology, Evolution, & Marine Biology
Webber, Jeanette – Santa Barbara Hotel Group
Wick, Tonya – National Marine Fisheries Service
Wolf, Patricia – California Department of Fish and Game (former)

Sanctuary Advisory Council Working Groups consulted, 1999-2004

Sanctuary Education Team
Conservation Working Group
Commercial Fishing Working Group
Recreational Fishing Working Group
Military Working Group
Ports and Harbors Working Group

8.0 LIST OF PREPARERS

Bates, Michelle, Biologist/Environmental Scientist, Tetra Tech, Inc.

B.S., 1997, Biology, Pepperdine University, California

M.E.S.M., 2000, Environmental Science and Management, University of California, Santa

Barbara

Years of Experience: 5

Bioregional Planning Associates (BPA), Consultant

Collinson, Thomas B., Vice President, Tetra Tech, Inc.

B.A., 1978, Geology, University of California, Berkeley

M.A., 1986, Geology, University of California, Santa Barbara

Years of Experience: 20

De Wit, Leray (Ray) A., Consultant

B.A., 1968, Biology, San Jose State University, California

M.A., 1973, Biology, San Jose State University, California

Years of Experience: 28

Eldridge, Jacqueline C., Publications Manager, Tetra Tech, Inc.

B.S., 1971, Biology, Fairleigh Dickinson University, Teaneck, New Jersey

M.S., 1978, Marine Science, Long Island University, Greenvale, New York

M.B.A., 1983, Business Administration, National University, Vista, California

Years of Experience: 26

Elliott, Brandon C., Word Processor I, Tetra Tech, Inc.

Computer Science, Santa Barbara City College, California

Years of Experience: 1

Emery, Angela D., Associate Environmental Scientist, Tetra Tech, Inc.

B.S., 1998, Environmental Studies (concentration Biology), University of California, Santa

Barbara

Years of Experience: 1

Engle, John M., Ph.D

Green, Alice V., Marine Resources Specialist, Tetra Tech, Inc.

B.A., 1976, Biology (concentration Marine Biology), University of Pennsylvania, Philadelphia

M.S., 1978, Management (concentration Marine Resources Management), Texas A&M

University, College Station

Years of Experience: 17

Howorth, Peter, Consultant

Principal Investigator, Marine Mammal Consulting Group

Years of Experience: 35

Ige, Geri K., Senior Graphic Designer, Tetra Tech, Inc.
Fine Arts, University of California, Irvine
Years of Experience: 19

Jacobsen, Amy S., Intern, Tetra Tech, Inc.
B.A., 2000, Environmental Studies with Geography Emphasis, University of California, Santa Barbara
Years of Experience: 1

Kefauver, Kathleen, Senior Biologist, Tetra Tech, Inc.
B.A., 1987, Biological Sciences, University of California, Santa Barbara
Years of Experience: 16

Kronman, Mick, Consultant

Leeworthy, Bob, NOAA, National Ocean Service, Special Projects
Leader, Coastal and Ocean Resource Economics Program
B.S., 1975, Economics, Florida State University
M.S., 1984, Economics, Florida State University
Ph.D., 1990, Economics, Florida State University

Lum, Luanne, Environmental Scientist, Tetra Tech, Inc.
B.A., 1985, Environmental Design and Planning, University of Colorado
Years of Experience: 13

Murray, Michael, Management Plan Coordinator, Channel Islands National Marine Sanctuary
B.S., 1988, Business Administration, California University Long Beach
M.S., 1997, Environmental Studies (Policy and Planning), California State University Fullerton
Years of Experience: 10

MacWilliams, Sarah, Management Plan Specialist, Channel Islands National Marine Sanctuary
B.A., 1997, Environmental, Population, and Organismic Biology, University of Colorado, Boulder
B.A., 1997, Cultural Anthropology, University of Colorado, Boulder
Master of Marine Affairs, 2002, Marine Resource Management, and Policy, University of Washington, School of Marine Affairs
Years of Experience: 7

Randall, Diane, Senior GIS Specialist, Tetra Tech, Inc.
Technical Certificate, Computer Programming, Sawyers College, Ventura, California
Technical Certificate, Program Management, Moorpark College, California
Years of Experience: 12

Rigby, Mark C., Ph.D., Consultant
B.A., 1993, Biological Sciences, University of California, Santa Barbara
M.Sc., 1996, Biological Sciences, University of Alberta, Edmonton
Ph.D., 1999, Experimental Ecology, Swiss Federal Institute of Technology in Zurich (ETHZ)
Years of Experience: 7

Schwemmer, Robert, Cultural Resources Coordinator, Channel Islands National Marine Sanctuary

Waltenberger, Ben, Spatial Data Analyst, Channel Islands National Marine Sanctuary

Walton, Anne, Management Plan Specialist, Channel Islands National Marine Sanctuary
Masters in Education, 1981, University of Kentucky
M.S., 1997, Marine Affairs, University of Washington

Warren, Shirley, Word Processor III, Tetra Tech, Inc.
B.A., 1992, Environmental Studies, CSU Sacramento, California
Minor: Geology
Years of Experience: 9

Wiley, Peter, NOAA, National Ocean Service, Special Projects
Economist, Coastal and Ocean Resource Economics Program
B.A., 1986, Economics, St. Mary's College of Maryland
M.A., 1999, Economics, The George Washington University

Wilson, Michelle, Project Manager, Tetra Tech
B.A., 1993, Environmental Science (concentration in Biology), University of California, Berkeley
Minor: Resource Management
Years of Experience: 12

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9 ACRONYMS AND ABBREVIATIONS

9.0 ACRONYMS AND ABBREVIATIONS

AEA	Admiralty Extension Act
AFB	Air Force Base
APPS	Act to Prevent Pollution from Ships
ARPA	Archaeological Resources Protection Act
ASA	Abandoned Shipwreck Act
ASBS	Area of Special Biological Significance
ATBA	area to be avoided
B.P.	before present
C	Celsius
CAA	Clean Air Act
CalCOFI	California Cooperative Oceanic Fisheries Investigations
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CINMS	Channel Islands National Marine Sanctuary
CINP	Channel Islands National Park
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMAR	Coastal Maritime Archaeology Resources
COLREGS	International Regulations for Preventing Collisions at Sea
CWA	Clean Water Act (<i>also known as Federal Water Pollution Control Act</i>)
CZARA	Coastal Zone Act Reauthorization Amendments
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Plan
DHSA	Death on the High Seas Act
DWRRA	Deep Water Royalty Relief Act
EA	Environmental Assessment
EEZ	exclusive economic zone
EIS	environmental impact statement (<i>NEPA</i>)
ESA	Endangered Species Act (<i>Federal</i>)
FMA	Flood Mitigation Assistance
FSRU	Floating storage and regasification unit
FWPCA	Federal Water Pollution Control Act
GIS	geographic information system
HAP	hazardous air pollutant
ICBM	intercontinental ballistic missile
IMO	International Maritime Organization

LCP	Local Coastal Program
MARPOL	International Convention for the Prevention of Pollution from Ships
MBTA	Migratory Bird Treaty Act
MHR	Maritime Heritage Resource
ml/L	milliliter(s) per liter
MLPA	Marine Life Protection Act
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
MOCZM	Massachusetts Office of Coastal Zone Management
mph	miles per hour
MPWC	motorized personal watercraft
MRWG	Marine Reserves Working Group
N	North
NAAQS	National Ambient Air Quality Standards (CAA)
NAWCWP	Naval Air Warfare Center Weapons Division
NBVC	Naval Base Ventura County
NCCOS	National Centers for Coastal Ocean Science
NEPA	National Environmental Policy Act (<i>Federal; 1969</i>)
NERR	National Estuarine Research Reserve System
NFIRA	National Flood Insurance Reform Act
NFMP	Nearshore Fishery Management Plan
NHPA	National Historic Preservation Act
NIH	National Institutes of Health
NM	nautical mile(s)
NMFS	National Marine Fisheries Service
NMSA	National Marine Sanctuaries Act
NMSP	National Marine Sanctuaries Program
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NO _x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System (CWA)
NPS	nonpoint source
NRC	Natural Research Council
OCIMF	Oil Companies International Marine Forum
OCS	Outer Continental Shelf
OCSLA	Outer Continental Shelf Lands Act
OPA	Oil Pollution Act of 1990
OPR	Office of Protected Resources
OSPR	Office of Oil Spill Prevention and Response
OTEC	Ocean Thermal Energy Conversion
PCB	polychlorinated biphenyl
PFMC	Pacific Fishery Management Council
PISCO	Partnership for Interdisciplinary Study of Coastal Oceans
PTSA	Port and Tanker Safety Act
PVA	Public Vessel Act

PWSA	Ports and Waterways Safety Act
ROG	reactive organic gas
RWQCB	Regional Water Quality Control Board
SAA	Suits in Admiralty Act
SAC	Sanctuary Advisory Council
Sanctuary	Channel Islands National Marine Sanctuary
SAR	search and rescue
SBCAPCD	Santa Barbara County Air Pollution Control District
SCAB	South Coast Air Basin
SCB	Southern California Bight
SCCWRP	Southern California Coastal Water Research Project
SCR	submerged cultural resource
SEIS	Supplemental Environmental Impact Statement
SMBRP	Santa Monica Bay Restoration Project
SO	Southern Oscillation
SST	sea surface temperature
STBL	ship to be lightered
SWQPA	State Water Quality Protection Area
SWRCB	State Water Resources Control Board (<i>California</i>)
TEU	twenty-foot equivalent units
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USCG	U.S. Coast Guard
U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VTSS	Vessel Traffic Separation Scheme
W	West
WCOOA	West Coast Offshore Operating Area
WDR	Waste Discharge Requirement
WSPA	Western States Petroleum Association

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10.0 GLOSSARY OF TERMS

Adaptive management. A process in which actions or a set of actions are taken, the effects of these actions are evaluated in terms of achieving overall goals, the actions are modified if they are not achieving the intended results, and information from early efforts is used to guide later efforts.

Adverse impact. A negative effect.

Aesthetic. Having to do with the outward appearance or visual properties. Especially used to describe preferable features.

Alternative actions. A reasonable range of options which can accomplish the objectives of a Proposed Action; for example, alternative locations for the proposed action. Under NEPA, the alternatives are analyzed in the same depth as the proposed action in an EIS to provide a thorough comparison. In addition, a no action alternative should be included in environmental impact analysis. *See also* National Environmental Policy Act, Proposed Action.

Ambient. Surrounding.

Anthropogenic. Of or relating to the influence of human beings on nature.

Artifact. A man-made object taken as a whole.

Attainment. As it pertains to air quality regulation, conforming to local air quality standards.

Avifauna. *Zoology.* Birds of a region or area.

Ballast water. Water confined in specially designed compartments in a vessel's hull that serves to stabilize the vessel.

Baseline conditions. The environmental conditions that exist before a proposed action is implemented. The baseline is used in environmental impact analysis to define the environment that may be impacted due to a proposed action.

Bilge water. Water accumulated in the bottom of a ship.

Biodegradable effluents. Water, bait, and other matter that are discharged and will naturally break down over time.

Biogeographical. Of or relating to the geographic distribution of plants and animals.

Biological Assessment. Under the ESA, each federal agency proposing an action that may affect a listed species is required to conduct an assessment on the species in applying for an exemption to the act (16 U.S.C. 1536).

Bioprospecting. *Biology.* The activity of seeking a useful application, process, or product from nature. In many cases, bioprospecting is a search for useful organic compounds in microorganisms, plants, and fungi (NPS 2003).

Bottom trawl. A type of fishing gear consisting of a cone or funnel-shaped net that is towed or drawn along the seafloor.

Chumash. The native Californians who occupied the Santa Barbara Channel Islands and mainland, from San Luis Obispo to Malibu Canyon along the coast, and inland to the western edge of the San Joaquin Valley (Grant 1978).

Coastal Consistency Determination. A determination of consistency by a federal agency given to the California Coastal Commission for projects in the coastal zone or affecting any land or water use or natural resource of the coastal zone. Not all projects in the coastal zone require a Coastal Consistency Determination; this is regulated by the California Coastal Commission. The process requires consultation with the California Coastal Commission to allow input on the scope of a project. *See also* coastal zone, consultation, significant impacts.

Coastal zone (California). A zone designation established by the California Coastal Commission under the CZMA of 1972. The coastal zone is determined by a number of factors, including habitat values and public access issues.

Commensurate. Having the same quantity, measure, or value as another.

Conservation. Improvement by virtue of preventing loss or injury or other change.

Consultation. A formal meeting process with the lead agency and other federal regulatory agencies to involve other agencies in the preparation of environmental documentation. Some consultations are required under law, such as USFWS or NOAA consultation under Section 7 of the ESA. *See also* lead agency.

Context. Under NEPA, the setting of the proposed action. The significance must be based on several contexts: society as a whole, the affected region, the affected interests, and the locality (Bass and Herson 1993). *See also* National Environmental Policy Act, significant impact.

Consumer surplus. The amount that a person is willing to pay for a good or service over and above what he actually has to pay for a good or service. The value received is a surplus or net benefit. In the case of natural resources, for which there is no owner and a price cannot be charged for use of the resources, consumer's surplus is referred to as a nonmarket economic value since the goods and services from the natural resources are not traded in markets.

Cooperating agency. Under NEPA, an agency, other than the lead agency, that has jurisdiction over or expertise with a particular proposed action and therefore provides input to the lead agency during the environmental impact analysis. *See also* lead agency, National Environmental Policy Act.

Critical habitat. Under the ESA, areas within the geographical area occupied by a listed species on which are found those physical or biological features essential to the conservation of the species and which may require special management considerations or protection. Critical habitat is determined by the Secretary of the Interior or Secretary of Commerce when an endangered species is listed and may also include areas outside the geographical area occupied by a listed species that the Secretary determines to be essential for the conservation of the species (16 U.S.C. 1532). *See also* endangered species, Endangered Species Act.

Cumulative impact or effect. An impact that is a result of an incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Diurnal. Pertaining to the day; occurring each day. *Zoology:* Being active (i.e., hunting, feeding, breeding) primarily during the day.

Dredging. The process of scooping or digging out sediment to deepen a channel bed.

El Niño. A Pacific weather pattern that occurs every decade, on average, causing warmer ocean temperatures and more rainfall.

Ecological. *Biology.* Characterized by the interdependence of living organisms in an environment.

Economic impact. Measures the economic importance of a use of resources in terms of expenditures made while undertaking an activity and the associated direct, indirect, and induced effects (multiplier impacts) on sales/output, income and employment (sometimes tax revenues are also included here) in local, regional, and national economies. The measurements used here are often referred to as market economic values because they are the measurements observed in actual transactions in an economy.

Economic rent. A return on investment over and above a normal rate of return on investment. A normal rate of return on investment is the rate of return in which incentives are such that capital will neither outflow or inflow into an industry. This is a special form of producer's surplus.

Economic value. This term generally refers to net economic values such as consumer's surplus, producer's surplus, or a special form of producer's surplus—economic rents (above normal returns to investment). The term also generally refers to the class of economic values called nonmarket economic values because this portion of economic value is not captured in market data.

Ecosystem. *Biology.* A system created by a community of organisms with their physical environment.

Effluent. A material or other matter flowing outward.

Endangered species. *Biology.* Under the ESA, any species that is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary of the Interior to constitute a pest whose protection under the provisions of the ESA would present an overwhelming and overriding risk to humans (16 U.S.C. 1532). *See also* Endangered Species Act.

Endemic. Native, belonging to a particular region.

Environmental Assessment (EA). Under NEPA, a preliminary environmental document prepared by a lead agency for a proposed action that is not considered eligible for a categorical exclusion. The EA determines whether the proposed action would have a significant impact on the environment. If a potentially significant impact is identified, the lead agency must prepare an EIS, which is the next step in the NEPA impact analysis process. *See also* Environmental Impact Statement, lead agency, National Environmental Policy Act, significant impact.

Environmental Impact Statement (EIS). An environmental document under NEPA that is required for federal actions that have a significant impact on some aspect of the human environment. An EIS contains

a description of the proposed action and alternatives, the baseline environment that may be affected by the action, and the impacts associated with the action or alternatives. Also included are mitigation measures designed to reduce impacts to a less than significant level. *See also* Environmental Assessment, lead agency, National Environmental Policy Act, significant impact.

Environmentally preferable. Products or services that are undertaken in way that reduces the impacts on the environment. For example, recycled paper reduces the need for natural resources (i.e., trees) and reduces waste being disposed of in a landfill.

Estuarine. *Botany.* A wetland area occurring near an estuary (waterway where the tide meets a river current).

Evolutionarily Significant Unit (ESU). *Conservation biology.* A population of a species that is reproductively isolated from other population units within the species and represents an important component in the evolutionary legacy of the species.

Fauna. *Biology.* Wildlife.

Feasible. Practical, able to be accomplished successfully.

Flora. *Biology.* Plant life.

Geomorphology. The study of the evolution and configuration of landforms.

Hazardous materials. Substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, would present substantial danger to public health and welfare or to the environment when released.

Hazardous wastes. Hazardous materials that are no longer usable or intended for use. *See also* hazardous materials.

Holocene. *Geology.* A geologic time period of the latter part of the Quaternary Period, extending from the end of the Pleistocene to the present. *See also* Pleistocene.

Hydrocarbon. Organic compounds consisting of only oxygen, hydrogen, and carbon atoms that are the main components of petroleum products.

Hydrologic. Pertaining to the study of water.

Impact. An effect.

Incidental take. Under the ESA, take that is a result of, but not the purpose of, carrying out an otherwise lawful federal action. An “incidental take permit” may be granted by the Secretary of the Interior or Commerce to a federal agency that has prepared a conservation plan that specifies the impacts associated with the taking, mitigation measures to reduce the impacts, and alternatives to the proposed action. *See also* endangered species, take.

Infeasible. Impractical, unable to be successfully undertaken.

Intensity. Under NEPA, the severity of an impact, based on such factors as beneficial effects, public health, unique characteristics, degree of controversy, degree of unique or unknown risk, precedent-setting effects, cumulative effects, presence of cultural or historical resources, or presence of special-status species. *See also* National Environmental Policy Act, significant impact.

Intertidal zone. The zone of marine habitat that is part of the littoral zone above the low-tide mark.

Jurisdiction. The right and power to interpret and apply the law.

Lead agency. The agency or agencies that have taken the primary responsibility for preparing the environmental impact statement for a proposed action under NEPA.

Lightering. At sea transfer of petroleum-based products, materials, or other matter from vessel to vessel.

Listed species. *Biology.* Under the ESA, either an endangered or a threatened species. *See also* endangered species, Endangered Species Act, threatened species.

Lithic. *Geology.* Consisting of or relating to stone or rock.

Long-term impact. An impact lasting for an unspecified or extended period of time.

Mano. A tool, such as a stone or roller, that is used for grinding grains or seeds.

Marine sanitation device. Any equipment on board a vessel that is designed to receive, retain, treat, or discharge sewage, and any process to treat sewage on board.

Maritime. Relating to the ocean.

Market economic value. *See* economic impact.

Mineral. *Geology.* Clay, stone, sand, gravel, metalliferous ore, non-metalliferous ore, or any other solid material or other matter of commercial value.

Mitigation measure. A measure designed to address an environmental problem. Per NEPA, adequate mitigation must, for example, adequately avoid, minimize, rectify, reduce, eliminate, or compensate for an environmental impact caused by a proposed action. *See also* unmitigatable impact.

Multiplier effects of impacts. This term refers to the secondary or ripple effects of spending in an economy for a given activity. Often multiplier impacts are broken down into indirect and induced impacts. Indirect impacts include the purchasing of inputs to produce a good or service such as wages for labor, electricity, water, and sewage services, capital, etc. Induced impacts include the next and following rounds of spending as workers and owners spend their incomes for goods and services and the recipients of this spending repeat this process. For any given economy, this process is limited by how much of the spending stays in the given area. The larger the study area for impact analysis, the larger the multiplier because more of the inputs of production are from the study area.

National Environmental Policy Act (NEPA). U.S. law passed January 1, 1970, creating the Council on Environmental Quality and encouraging productive and enjoyable harmony between people and the environment. Other stated goals include preventing damage to the environment and biosphere, stimulating health and welfare, and enriching the understanding of the ecological system and natural

resources important to the nation. *See also* Environmental Assessment, Environmental Impact Statement, lead agency.

Native. Belonging to a particular region.

Navigation aid. Any instrument used to assist in the guidance of ships or other vessels from place to place.

Nonconformance. Not complying with regulation or determined standards, such as local air quality limits.

Nonrenewable resources. Resources that are not replenished or rejuvenated within a usable time frame, such as petroleum products or old-growth forests.

Nonmarket economic value. *See* consumer's surplus, producer's surplus, and economic rents.

Notice of Intent (NOI). The first step in preparing an EIS is to publish an NOI in the *Federal Register*. In accordance with NEPA, an NOI must include a description of the proposed action and alternatives, a description of the scoping process and any scoping meetings, and the name and address of a contact person within the lead agency. *See also* Environmental Impact Statement, lead agency, National Environmental Policy Act, scoping.

Ozone (O₃). An air pollutant formed photogenically through a reaction with NO_x and VOCs.

Paleocoastal. Early coastal cultures, described by Moratto (1984).

Parameters. Features that may be measured. Often used in scientific or statistical descriptions of a population or subject of study.

Performance indicators. Criteria that are used to evaluate the success of a particular plan or program.

Pier. A vertical structure that support the spans of a bridge.

Pile. A heavy beam of timber, concrete, or steel, driven into the earth as a foundation or support for a structure.

Pleistocene. A geologic time period of the early Quaternary Period, characterized by alternating appearance and recession of northern glaciation and the appearance of the ancestors of human beings.

Precautionary approach. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

Producer's surplus. The amount a producer receives for a good or service above the costs of producing a good or service.

Propagating. *Biology.* Transmitting from one generation to the next.

Proposed action. A planned action that exists at the stage when a lead agency has a goal and is actively preparing to make a decision on one or more alternative means of accomplishing that goal. The Proposed

Action is the preferred alternative of the lead agency. At this stage, the effects of the Proposed Action can be adequately evaluated. *See also* lead agency, National Environmental Policy Act.

Radiocarbon date. An estimated age of an ancient object, such as an archaeological specimen, determined by measuring the amount of carbon-14 (a naturally radioactive isotope of carbon) that it contains.

Reasonably foreseeable. The range of actions or events that will probably occur in the near future.

Reconnaissance. A preliminary study or survey of an area.

Riverine. *Botany.* A wetland occurring near a river.

Roost. *Zoology.* To sit, rest, or sleep atop a pole or tree; a place where birds rest.

Scoping. A public process designed to determine the scope of issues to be addressed in an EIS and to help identify any significant impacts relating to the proposed action. The “scope” of an EIS includes the types of actions to be included, the range of alternatives, and the impacts to be considered. *See also* Environmental Impact Statement.

Seine. A large fish net with sinkers on one edge and floats on the other. A seine hangs vertically in the water and is used to capture fish when its ends are pulled together.

Short-term impact. An impact occurring for a specified and limited amount of time.

Significant impact. Under NEPA, an impact on some aspect of the environment or public health and safety caused by an action that exceeds a set criterion or established threshold. When determining whether an impact is significant, the analyst must consider the “context” in which it will occur and the “intensity” of the proposed action. If a proposed action has the potential for a significant impact, an EIS must be prepared. *See also* Environmental Impact Statement, intensity, National Environmental Policy Act, threshold.

Socioeconomics. The study of society as it relates to the social or economic aspects of a given activity or set of activities. Theory and applied tools from the fields of economics, sociology, anthropology, political science, public administration, and history are used.

Species. *Biology.* Taxonomic group whose members can interbreed and produce viable offspring.

Stringent. As applied to a rule or standard, having rigor, strictness, or severity.

Submerged lands. The lands underlying the waters of the Sanctuary.

Substrate. The material that an organism, such as a plant, lives on or is attached to.

Sustainability. The property of being maintained at length without interruption or weakening.

Threatened species. *Biology.* Under the ESA, any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (16 U.S.C. 1532). *See also* ESA.

Threshold. A point separating conditions that will produce a given effect from conditions that will not produce the effect.

Tomol. A plank canoe used by marine-oriented Native Americans, especially the Chumash. *See also* Chumash.

Total petroleum hydrocarbons (TPH). A measurement of hydrocarbon contamination that can be attributed to petroleum.

Tsunami. A long period sea wave generated by a subsea earthquake or volcanic eruption that may travel thousands of miles. Tsunamis cause damage when they inundate coastal areas.

Turbidity. The measure or state of sediment or other particles suspended in water.

Unconsolidated. Not of one coherent body. *Geology:* unconsolidated sediments, deposits, etc.

Unmitigatable impact. A significant impact that cannot be lessened to insignificance with mitigation. *See also* mitigation measure, significant impact.

Vernal pool. *Biology.* A temporary wetland that forms in a shallow depression underlain by a substrate that restricts the percolation of water into the ground. *See also* wetland.

Watershed. A topographically delineated region or area drained by a stream system. A hydrologic unit frequently used as a physical-biological unit and a socio economic-political unit for management and planning of natural resources bounded peripherally by a water parting and draining ultimately to a particular watercourse or body of water.

Wetlands. *Biology.* Under the Federal Water Pollution Control Act, areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR 328.3).

A NOTICE OF INTENT AND PUBLIC SCOPING PROCESS

A.1 NOTICE OF INTENT (NOI)

APPENDIX A.1

NOTICE OF INTENT

[Federal Register: June 11, 1999 (Volume 64, Number 112)]
[Proposed Rules]
[Page 31528-31529]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]
[DOCID:fr11jn99-19]

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

15 CFR Part 922

Initiation of Review of Management Plan/Regulations of the Channel Islands National Marine Sanctuary;
Intent to Prepare a Draft Environmental Impact Statement and Management Plan; Scoping Meetings

AGENCY: Office of Ocean and Coastal Resource Management (OCRM), National Ocean Service (NOS),
National Oceanic and Atmospheric Administration, Department of Commerce (DOC).

ACTION: Initiation of review of management plan/regulations; intent to prepare environmental impact
statement; scoping meetings.

SUMMARY: The Channel Islands National Marine Sanctuary (CINMS or Sanctuary) was designated in September 1980, and consists of 1,252 square nautical miles of open ocean and near shore habitat approximately 25 miles off the coast of Santa Barbara, California, encompassing the waters surrounding San Miguel, Santa Rosa, Santa Cruz, Anacapa and Santa Barbara Islands from mean high tide to six nautical miles offshore. The present management plan for the Sanctuary was completed in 1982. In accordance with Section 304(e) of the National Marine Sanctuaries Act, as amended, (NMSA) (16 U.S.C. 1431 et seq.), the Marine Sanctuaries Division (MSD) of the National Oceanic and Atmospheric Administration (NOAA) is initiating a review of the management plan, to evaluate substantive progress toward implementing the goals for the Sanctuary, and to make revisions to the plan and regulations as necessary to fulfill the purposes and policies of the NMSA.

The proposed revised management plan will likely involve changes to existing policies and regulations of the Sanctuary, to address contemporary issues and challenges, and to better protect and manage the Sanctuary's resources and qualities. The review process is composed of four major stages: information collection and characterization; preparation and release of a draft management plan/environmental impact statement, and any proposed amendments to the regulations; public review and comment; preparation and release of a final management plan/environmental impact statement, and any final amendments to the regulations. NOAA anticipates completion of the revised management plan and concomitant documents

will require approximately eighteen to twenty-four months. NOAA will conduct public scoping meetings to gather information and other comments from individuals, organizations, and government agencies on the scope, types and significance of issues related to the sanctuary's management plan and regulations. The scoping meetings are scheduled for the weeks of June 21 and July 5, 1999, as detailed below.

DATES: Written comments should be received on or before July 27, 1999.

Scoping meetings will be held:

- (1) Monday, June 21, 1999, 6:30pm in Lompoc.
- (2) Tuesday, June 22, 1999, 6:30pm in Santa Barbara.
- (3) Wednesday, June 23, 1999, 6:30pm in Oxnard.
- (4) Thursday, June 24, 1999, 6:30pm in Long Beach.
- (5) Friday, June 25, 1999, 6:30pm in Ventura.
- (6) Wednesday, July 14, 1999, 2:00pm in Washington, D.C. addresses: Written comments may be sent to the Channel Islands National Marine Sanctuary (Management Plan Review), 113 Harbor Way, Santa Barbara, California 93109. Comments will be available for public review at the same address.

Scoping meetings will be held at:

- (1) Cabrillo High School, Room SS-5, 4350 Constellation Rd., Lompoc, CA 93456.
- (2) Chase Palm Park Center, 323 East Cabrillo, Santa Barbara, CA 93103.
- (3) Casa Sirena Hotel and Marina, 3605 Peninsula Rd., Oxnard, CA 93035.
- (4) Long Beach Aquarium Theatre, Long Beach, CA 90802.
- (5) Sheraton 4-Points, Windjammers Meeting Room, 1080 Navigation, Ventura, CA 93001.
- (6) Herbert C. Hoover Building, 14th & Constitution Avenue, NW, Washington, DC 20230.

FOR FURTHER INFORMATION CONTACT: Anne Walton, Management Plan Specialist, at (805) 884-1470.

Authority: 16 U.S.C. Section 1431 et seq.

(Federal Domestic Assistance Catalog Number 11.429 Marine Sanctuary Program)

Dated: June 4, 1999.

John Oliver,
Chief Financial Officer/Chief Administrative Officer, National Ocean Service.

[FR Doc. 99-14717 Filed 6-10-99; 8:45 am]

BILLING CODE 3510-08-M

A.2 DOCUMENTATION OF SCOPING PROCESS

APPENDIX A.2

DOCUMENTATION OF SCOPING PROCESS

Public involvement, through scoping, Sanctuary Advisory Councils, workshops, public hearings, submission of written comments, and other means, is vital to the management plan review process and helps Sanctuaries to identify resource management issues and possible solutions. Since CINMS initiated its management plan revision in 1998 the Sanctuary has received comments from thousands of individuals (see the scoping comments archive below). CINMS encourages members of the public to continue expressing their ideas and concerns about the management plan revision through numerous opportunities to comment and get involved.

A.2.1 PUBLIC SCOPING

The Council on Environmental Quality (CEQ) requires Federal agencies to conduct scoping prior to preparing an Environmental Impact Statement (EIS) for a proposed action. According to CEQ regulations (40 Code of Federal Regulations Section 1501.7), "There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This process shall be termed scoping."

CINMS conducted scoping prior to preparing an EIS as part of the management plan review process. From June to August of 1999 CINMS held seven public scoping meetings on management plan revision across Santa Barbara, Ventura, and Los Angeles counties, as well as in Washington, D.C. During those meetings numerous individuals raised a wide range of local, regional and national resource concerns and management suggestions. In addition, the Sanctuary received numerous comments about management plan revision via letters, email, and fax. Sanctuary staff compiled these comments and suggestions in two formats: 1) in raw form organized by scoping meeting location, and 2) in synthesized form and organized by issue categories.

A.2.1.1 Public Scoping Comments - Organized by Location

Please note that these are the raw comments extracted from seven public scoping meetings (held from June to August, 1999) along with letters, faxes, and emails received during and after those meetings. These comments were edited for clarity where necessary.

Lompoc

- The Sanctuary needs to be proactive about terrestrial impacts on water quality, (including terrestrial runoff on islands and link to non-native species)
- The Sanctuary needs to evaluate current military activity and impacts on the environment
- Better education needed for recreational divers on their impacts on the resources (from both consumptive activities and the activity of diving itself)
- The Sanctuary should look at creating artificial habitats from out of commission oil rigs and the sinking of ships
- Improve education and outreach efforts to better educate the public about the Sanctuary, its boundaries and resources

- Increase monitoring and enforcement efforts
- The Sanctuary should help to improve marine education in the public school system
- The Sanctuary should focus on habitat needs (fisheries stocks and the physical/biological habitat) including preservation and restoration
- The Sanctuary should work better with other regulatory agencies in managing the resources
- The Sanctuary should consider its position with the expanding range of the sea otter
- Make any Sanctuary restrictions easy and logical for the public
- Keep access to the Sanctuary open to the public, make it smart and protect the resources for future generations

Santa Barbara

- Use adaptive management as the framework for the management plan
- Increase collaboration between agencies
- Adopt an ecosystem approach to management
- Increase and/or establish no take zones to protect biodiversity
- Evaluate accommodation and impacts of sea otters
- Evaluate level and effectiveness of enforcement of regulations
- Conduct a full inventory of species by habitat type, characterize habitats, assess health, look at natural fluctuations vs. human impacts - evaluate the condition of the resources from a scientific perspective
- Incorporate performance standards
- Address water quality issues including looking at impacts from outside Sanctuary boundaries
- Evaluate the impacts on the resources from commercial fisheries and consider no-take zones as a management tool
- Identify and evaluate recreational, military, oil and gas impacts, take steps to limit the uses found to create negative impacts, or mitigate if appropriate
- Refocus on resource protection rather than use
- Balance of protection and use based on scientific information instead of emotion (politics)
- Expand boundaries north to Santa Rosa Creek with goal of protecting biodiversity
- Study impacts of commercial fishing on the resources
- Include land use issues in management plan (non-point source pollution, etc.)
- Improve public education and outreach efforts
- Evaluate impacts from oil drilling including vessel strikes, pipes, platform blowout, other accidents, potential for increased drilling, impacts on tourism

- Evaluate commercial fishing impacts: ships and fleets from outside region, impacts of lights on marine mammals, separate impacts from El Nino from commercial fishing impacts, look at the impacts of squid fishing on dolphins and pinnipeds
- Evaluate the health of kelp, look at impacts from siltation, pollution, run-off, plumes
- Look at general issues of non-point source pollution
- Need to focus on research and include participation of commercial fisherman
- Look at sea otters and the disruption of the ecosystem, the use of mariculture to feed them
- Look at impacts from increasing population and decreasing resources
- Consider interconnections of habitats and ecosystem (reduce stresses on the system, examine impacts)
- Concerned about limitation on access or use of resources, willingness to accept limitations if guarantee continuation of access to fisheries
- Boundary expansion to include entire channel (safety, efficiency, information exchange, environmental reasons), and Santa Catalina
- Better coordination of agencies that share jurisdiction over the resources
- Increase support for Sanctuary by increasing education and awareness
- Sanctuary needs to work with Park Service on impacts on marine environment from terrestrial activities on islands (virus in mice, fox hunting, erosion, runoff)
- Expand boundaries northward because of richness, dynamic province, it may contribute to the Channel Islands ecosystems, strong upwelling components for overall system - threats include development, oil, mining, (even potential threats to health of the coastal zone)
- Make boundary determinations based on ecosystem perspective
- Management plan must call for an active role in oil/gas lease agreements/sales
- Sanctuary to consider effects of rigs-to-reef on surrounding environments
- Define more clearly the authorities of the Sanctuary, investigate possibility of accruing greater authority
- Sanctuary should partner with coastal water shed and water quality groups
- Need to understand what happens nearshore and inter-islands ecologically and with regard to water quality
- Resource management should be based on a thorough understanding of ecosystem management vs. species by species management
- Boundaries should expand to shore to encompass: ecosystem perspective, connection between ocean and land, water quality
- Sanctuary expansion should provide forum to merge interest groups and concerns
- As part of the management plan review process, maps of the islands and Sanctuary boundaries should be placed on the website with links to other interest groups. Do this to encourage public interest and ownership of the process, include: what Sanctuary is, what Sanctuary does and does

not do, maps showing resources, activities and issues. Do this in simple language, clear English, concept oriented

- Enhance outreach efforts to stimulate public involvement in management plan revision process, foster stewardship
- Understand dynamism of ecosystems and our role in monitoring, evaluate to result in adaptive management
- Increase funding to achieve objectives
- Use CalCOFI data and increase water quality data collection to CalCOFI stations and in between those stations (closer to shore and more offshore)
- Mooring systems for boaters who regularly visit islands (protect kelp and bottom)
- Better weather reporting (more sites, live cameras on islands, more real-time reports) to improve safety
- Provide hard copies of current management plan in public libraries
- Better enforcement and monitoring
- Northward boundary expansion to protect spawning grounds
- Revitalizing coastal Chumash culture, question of access to sacred areas (don't want any restrictions on access)
- Concern about threat of oil leases being exercised
- Marine reserves - for protection of sea otters/macro invertebrates
- Different jurisdictional authorities need to be identified, Sanctuary needs to have influence
- Sanctuary should be coordinating agency for other authorities and needs more regulatory authority
- Sanctuary should address water quality issues
- Sanctuary should make connections between watersheds and ocean systems through education and outreach
- Concern about oil/gas leases - include language (to maximize protection of the resources) in the reauthorization of renewal of existing leases
- Concern about increased use of the area, not more regulation of multi-use (ecotourism)
- If the SAC will be dealing with boundary expansion issues, then San Luis Obispo should be represented on Sanctuary Advisory Council
- Chumash would like to be represented on the SAC

Oxnard

- Interest in monitoring of abalone populations
- Concern about impacts from military activity and expansion plans (Navy Sea Test Range)
- Concern about discharge from fishing vessels

- Education/outreach should be a top priority: more resources and activities, focus on primary schools, expand programs outside of Santa Barbara, teacher workshops, develop this at early age, provide more direct interaction with the marine resources, interpretive enforcement (backed up by law enforcement)
- Investigate our use of terms such as "resources", "no-take zones"
- Take resource management out of the hands of the Dept. of Commerce
- Laws should be made adequate enough to protect the resources
- Limited entry for divers
- No-take zones with limited access demonize certain activities, no-take zones should be absolute, that don't let anyone in except for navigation
- Visitor use should be limited and appropriate such as the use of sea caves where there are nesting seabirds

Long Beach

- Concerned about protecting sea otters
- Opposed to oil and gas development in the channel
- Concerned about funding - adequate financial resources to carry out mission
- Concerned about impacts from recreational boaters, more education needed yacht clubs
- Need to address habitat enhancement for endangered species - should be a priority over human use
- Need to address the threat that non-native species pose to endangered species
- Need to take a look at maximum enforcement of regulations
- Need a comprehensive and complete management plan with research areas - no-take zones and ground truth areas for sampling
- Need to be strong about what is allowable and what is not
- The management should address terrestrial impacts on the Sanctuary - the relationship between human activities in the island watersheds and the effect on the intertidal
- Enforcement should allow for more than paper protection (need citations, fines, etc.)
- Concerned about aquaria collectors taking too many resources
- Need to recruit stewards of the Sanctuary
- The Sanctuary needs to engage in "gorilla" marketing (more aggressive self-promotion)
- Concerned about tanker traffic
- Concerned about water quality
- Concerned about the impact of kelp forests from urchin harvest

Ventura

- Interested (as a fisherman) what areas may be closed down
- Interested in seeing increased protection
- Would like to see water quality issues addressed in management plan
- Sea Test Range should be recognized as a use (having impacts on the Sanctuary)
- Coastal Ventura County is concerned with impacts in their area
- Need more offshore protection - need to sponsor a new bill for a new Sanctuary between Monterey Bay National Marine Sanctuary and Channel Islands National Marine Sanctuary – concerned about: offshore oil, fishing, would also support expansion to existing boundary
- Want to see a rotating closure for sea urchin fishery - pollution is the biggest issue, an all out closure would kill the fishery
- Sanctuary should take into account and be prepared for significant increase in military activity
- Sanctuary needs increase in protection from radar activity and not plan as if the military doesn't exist
- Need more outreach and partnerships with agencies, nongovernmental organizations, and in particular DOD - look to other more recent sanctuaries and their relationship to Dept. of Defense - be staunch in our own defense
- Concerned with nearshore water quality: more pressure on fish in islands, plume from Santa Clara river, make CINMS concerns apparent to other agencies
- Provide more education opportunities for the public
- Navy stated that they would be willing to share information on marine mammals, air quality, etc. with the Sanctuary to use in their EIS
- Interest in authorities and priorities - very confusing: outreach problem - public needs to be educated, need information in a sound bit
- Expand Sanctuary boundaries - include coast, make as big as possible, more needs to be protected, address coastal water quality issues, boundaries are too arbitrary and don't address threats outside boundaries
- Otters will cause more conflict with people who rely on the resources, CINMS should be prepared

Washington, D.C.

- Need to spell and formalize (including relationships with other agencies) the process for the management plan and marine reserves
- Marine reserve issue needs to fundamentally be part of the management plan
- Need to realize impact of extractive activities on the decline of the marine resources (rock fish, giant sea bass, etc)

- Support for exploring various issues within the issues of boundary expansion - tie to rationale - water quality, oil & gas, critical in EIS to state how boundary expansion will address these other issues
- Issue of funding and resources if boundary expand, need to develop budget to support
- Implementing new management plan will require more resources
- If you do reach out to the nearshore, suggest you include impacts/events in programs
- Need to consider runoff from Channel Islands due to erosion
- First priority for management plan should be emphasis on activities within current boundaries and why marine reserves are a critical issue
- Need to consider dynamics of sea otters as functional part of original community in Channel Islands and the roll of CINMS in re-establishing populations

San Luis Obispo

- If CINMS expanded the boundary, what could you do
- Need to have more oversight of discharge in SLO (two power plants), and monitor intake as well
- Concerned about development of 40 oil and gas leases off of SLO County
- What can the sanctuary do that existing agencies don't already do
- Need local CINMS presence
- Need to maintain sustainable fisheries
- Would boundary redefinition change the focus/mission of CINMS
- Concerned about status of resources on Santa Lucia Bank. Marine living resources don't know boundaries - are found in between sanctuaries, they need protection in all areas
- Need to create new sanctuary for: 1) local presence and control, 2) Point Conception to Point Blanca, 3) local needs/concerns need to be presented, 4) different environment, need different sanctuary, 5) might want higher standard (stricter regulations) for this area
- Need connection between CINMS and MBNMS
- Pinnipeds are overpopulated is the sanctuary going to do anything
- Ban personal watercraft
- Sanctuary status gives one more level of protection
- Focus on issues and threats protection of resources is paramount
- Oil out - concern about impacts on environment, must extend far enough to include federal leases
- Allow compatible uses of resources, eliminate incompatible uses
- Concerned that without prohibiting oil, it will still be allowed
- Existing plots should be researched before being allowed to be developed
- Concerned about rigs-to-reefs

- Citizen action is critical
- Trust relations with governments, what has both MBNMS and CINMS done since regulation to protect resources
- Local sanctuary needed to meet and address this community's need
- Need to define process for local sanctuary
- Implement and support research projects
- Slow down oil lease/platform development process
- Education should be about the resources
- General concern for health of the ocean; sanctuaries offer an opportunity to protect; need for comprehensive protection - ecosystem management
- If boundary expanded or new one designated, need local office
- Need community representation
- Concern that decision making would not occur locally
- Concern over regulation of kelp beds, concerned the MBNMS regulation of kelp beds could affect CINMS
- Concern that public will be shut out of regulatory process
- International designation of biosphere reserve could increase regulation/authority affecting the state's/county's resources
- Concern about impacts from commercial and sport fishing
- Confusion over resource protection, what specifically does the Sanctuary do
- Concern over fishery management and potential for sanctuaries to become involved in this
- Would the establishment of a sanctuary stop existing oil and gas leases, new leases
- Concern over the development of 40 undeveloped offshore leases, is there something that can be done
- Concern about water quality and non-point source pollution
- Support for sanctuary designation to address non-point source pollution
- Need for specific language to address sediment loads and specific sources of pollution, near shore resources have been impacted
- Need for summarizing of research that decision makers and the public can understand
- Concerned about harbor maintenance activities being further regulated
- Concern that fishery regulations might be put in place at a later time
- Concerned about dredging regulations that would impact fisheries
- Concerned that vessel traffic regulations may affect fisherman
- Concern that prohibitions of new structures would affect fisherman
- Too many stakeholders - not all needs can be met

- Concern that a local office needs to be established to represent local people
- Concern that reauthorization is a blank check to make changes in the program that would detrimentally affect fisherman
- Does not believe there are the same water qualities as the east coast
- Does not support expansion of the CINMS boundaries
- Support for expansion of CINMS to SLO - sanctuary would offer opportunity to preserve resources
- Need for comprehensive representation
- Concern about no take zones in other sanctuaries
- Concerned about mistakes made by resource managers
- Sanctuary program would bring in more democracy – increase public involvement in management issues
- How would new boundaries be selected or developed
- If boundaries extend to shoreline, do regulations apply upstream
- How is the public specifically involved in the process to expand CINMS boundaries
- Will CINMS come back to SLO after DEIS to hear comments
- Concern about oil and gas development
- Concern about polluted runoff
- Concern about motorized personal watercraft
- Concern about water quality
- Concerned about commercial fisheries being sustainable
- If it isn't broke, why fix it, many regulations already in place
- Lack of education about resources with policy makers
- Collapse of certain fishery resources in spite of regulations
- Establishment of no take zones - what are effects on commercial fishing
- Define role of National Marine Sanctuary Program
- Will designation change oil leases and discharges
- Watershed issues - establishing protection for these areas
- Residents love coastline, looking for mechanism to protect it
- Concerned about restrictions of commercial fishing in Morro Bay and Avila Beach, want to protect livelihoods
- Need sustainable fishing resources, regulations are important to protect environment and marine inhabitants in general
- Need to be careful of selective protection

- Ecosystem based approach
- Is there a proposed expansion
- We don't have to make 1,000's of miles of oceans of private aquarium
- Consider boundary expansion alternative
- Balance between protection and commercial fishing
- Need local control an input
- Stop industrial assault
- Protection needs to come from existing national marine sanctuary
- Fishing industry concerned with trust, what does sanctuary do
- The following items need action now, not 5 years from now: oil, water quality, unregulated motorized personal watercraft
- Sanctuary provides umbrella
- Education of public is important, what is protection
- Does sanctuary designation improve water quality

Written Comments

- Establish the proposed Central Coast National Marine Sanctuary or expand CINMS to include waters from Pt. Arguello to the southern end of MBNMS
- Need local hearing on management plan in San Luis Obispo County
- Create a marine sanctuary off the coast of San Luis Obispo
- In favor of proposal to create a separate sanctuary for the central coast area
- Report from commercial fisherman in Oxnard: kelp is bouncing back, sea urchins = lots and a lot of legal picking size - the best in years, sea cucumbers- seeing alot in all sizes, Santa Rosa and Miguel = alot of abalone except where sport divers dive, alot of large sheephead and other fish are larger
- Support for extension of the area managed by CINMS to include, as a minimum, Santa Lucia Bank area in San Luis Obispo County with consideration to include the intertidal zone from Pismo Beach to Avila Beach
- The revised management plan should include a comprehensive, coordinated strategy for protecting resources from water quality impairment (land based pollution), efforts should include in increased public awareness, research and monitoring
- Develop water quality strategy that includes wastes from boats including no-discharge zones
- Include provisions for prohibiting discharge outside of Sanctuary boundaries that may impact Sanctuary resources
- Propose to designate more ecological reserves within the Sanctuary to protect marine biodiversity: maintain key processes in a relatively undisturbed manner, lessen impact of large

scale natural disasters, increase understanding of the marine environment, provide research opportunities

- '15 CFR 922.71' (exploring for, developing, and producing hydrocarbons), this section should be clarified so that any of these activities will be prohibited. Should also include prohibiting the exploration for, development, or production of minerals.
- Management plan should stress forming new partnerships with other federal and state agencies, research institutions, local governments, user groups, citizen groups, and others to implement a strategy for restoring and protecting Channel Islands ecosystem
- Expand the boundaries to improve protection of wildlife from pollution, expanding offshore oil drilling, and other potential threats
- Add language to Sanctuary regulations to govern the relationship with Dept. of Defense, regulations should require all military activities to avoid to the Maximum Extent Practicable any adverse impact to Sanctuary's resources or quality
- Urges National Marine Sanctuary Designation for the Central Coast
- A need for a new marine sanctuary covering the central coast area between Monterey Bay National Marine Sanctuary and Channel Islands National Marine Sanctuary
- Fight against the activation of new offshore oil leases
- Develop a fishery management program under the auspices of Sanctuary
- Consider expanding the boundaries of CINMS to include the resources already identified in the draft revision to the site evaluation list or expansion of sanctuary boundaries to be studied as an alternative
- Boundary expansion of CINMS to include the coastal waters of Santa Barbara and San Luis Obispo County
- Need a permanent sanctuary on the Central Coast as protection from drilling (oil and gas)
- No commercial fishing or "taking" of any kind. There must be someplace where nature is truly safe from the wholesale destruction the human race specializes in. . . a place where nature is supreme
- Extend the boundaries northward into San Luis Obispo County, include the Santa Lucian Bank, a nursery for many marine species and San Simeon where the elephant seals nurse their pups.
- Extend the northern boundary to include the Santa Lucia Bank to protect an area critical to the life cycles of so many marine species of concern and preclude the imminent threat of new offshore oil development
- Of utmost importance is the need for the management plan to maximize the recovery of endangered and threatened species
- Consider the possibility of extending the boundaries of CINMS northward to include southern San Luis Obispo County and the Santa Lucia Bank
- NAVAIRWARCENWPNDIV requests the Sea Range operations that continue to utilize the CINMS waters and airspace above be recognized. This continued utilization is consistent with previous management plans and implementation regulations. These activities are conducted in compliance with all environmental and other regulations including stringent safety procedures to

ensure operating areas are cleared of all civilian air and ship traffic. Significant increases in the types and tempos of activities in the CINMS are not planned.

- Against all offshore drilling
- Urge consideration of expanding the CINMS northward to the southern boundary of the MBNMS, this expansion to include the Santa Lucia Bank
- Urge consideration of expanding the CINMS northward to the MBNMS, this expansion to include Santa Lucia Bank
- Concerned with nearshore water quality affects the entire region
- Coordinate with other federal and state agencies to improve nearshore water quality and restore critical habitat provided by the region's rivers and estuaries
- Concerned about current and future military operations within and directly adjacent to the sanctuary. The impact of this technology on marine mammals
- Recommend expansion of the CINMS boundaries to have greater control over regional influences that affect the sensitive marine environment
- Address the impacts of water pollution on the sanctuary and its wildlife
- Establish a network of sea life reserves to promote biodiversity, improve scientific understanding, maintain some areas of the oceans as wilderness
- Evaluate the advantages for the ecosystem by expanding the sanctuary's boundaries
- Improve coordination with federal and state agencies, particularly the Dept. of Defense
- Strengthen protections from expanded offshore oil and gas development and mineral extraction
- Coordinate fisheries research
- Highlight the significant need for increased federal appropriations to support existing and new responsibilities
- A plea to either extend the CINMS north to meet the southern edge of the MBNMS (Santa Rosa Creek at Cambria), or extend both to meet in the middle somewhere
- We request that an expansion of the Sanctuary boundaries be studied as an alternative and that it include development of a management plan that has quantifiable performance objectives
- The Navy objects to any proposed changes in the plan and regulations for the CINMS that would hinder Navy's ability to continue to train for combat readiness or test weapons systems in support of National defense
- The Santa Lucia Bank off of Point Sal causes upwelling of mineral-rich waters that provide nutrients to the CINMS, this would be an important addition to the ecosystem that is presently being managed with long-term sustainability in mind
- Marine sanctuary status would help us preserve this area as a renewal grounds for fisheries and the nearshore ecosystem. Fisherman would benefit from this in the long term
- Perception by fisherman that worldwide and local perceptions and concepts are driving fishery management decisions, not actual scientific information

- Concern about fishing access to the Channel islands area especially regarding the harvest refugia proposal. Constituents want to know whether reserves will be no-take or partial-take such as fishing for pelagic species but not benthic species. They also question how fair it is to keep humans out of no-take zones and not also consider marine mammal impacts.
- The impact of marine mammals (i.e., sea lions, harbor seals, sea otters) on coastal and pelagic species (i.e., northern anchovy, sardine, jack mackerel, Pacific mackerel) and recreational fish is a concern. There is a perception that the protection of marine mammals is having a devastating effect on fisheries on some of NMFS' constituents believe that marine mammals should be managed.
- Regarding the Channel Islands, some members of the public think there are enough marine reserves in California.
- Constituents also want to see economic studies performed on the effects of no-take areas
- Anecdotal information suggests that squid fishing operations working within sanctuary boundaries is altering the behavior of seabird species that roost and breed on the Channel Islands, resulting in increased nest abandonment and predation rates.
- Hazardous material spills resulting from activities within sanctuary boundaries, including leaks from commercial and recreational watercraft and spills from oil exploration or development activity could adversely affect many species and their prey bases. Oil spills are especially harmful to the endangered southern sea otter, as contact with oil decreases the southern sea otter's natural insulation against temperature loss and can result in hypothermia or death.
- The noise and vibrations from the operation of motorized watercraft or other heavy equipment may harass species and impair their ability to feed. This form of disturbance could cause individuals of many species to alter the behavior (e.g., activity periods, space use), resulting in increased risk of predation, reduces access to resources, and reduced breeding success.
- Disturbance from other recreational or commercial activities permitted within sanctuary boundaries, such as fishing, SCUBA diving, or snorkeling, could disturb species and affect their ability to forage or reproduce.
- Support expanding the Channel Islands National Marine Sanctuary to include the San Luis Obispo marine environment
- The status quo is simply too risky as periodic attempts are made to open up our coast to greater economic development.
- Urge you to support the extension of the Channel Islands Marine Sanctuary to our county (SLO).
- Support for the extension northward of the CINMS to include areas around and including the Santa Lucia Bank off the Santa Maria Basin, this is an area of extreme importance to fisheries and should in no case be exposed to risk by oil drilling and extraction operations by the development of existing lease sites
- Hold firm for the protection of the marine resources and let the politicians handle the lease issues
- I am in favor of expanding the CINMS boundary northward and am willing to dedicate my time and energy toward that reality

- Because of the biodiversity, it seems the central coast would be better served by creation of a completely new sanctuary, where a management plan can be developed to meet the unique challenges found here
- Would like to see expansion of the boundaries to Nipomo Dunes and Point Sal
- The purpose of this letter is to voice strong support for extending the CINMS to include the Central Coast islands
- Any material oil spill could have devastating effects and damage to these areas both north and south of the undeveloped leases. We strongly urge your CINMS group to sponsor such a study which would be extremely valuable information in getting marine sanctuary protection in this area. And it would be persuasive information for not allowing these undeveloped leases from being developed.
- I am convinced that it is extremely important to increase protections for the splendid CINMS. First, a revised management plan should clearly address the impact pollution has on the sanctuary's wildlife and water quality. Second, a revised management plan should establish effective sea life reserves within the sanctuary where human activities are limited and strictly monitored. Finally, it is essential that the new plan will study whether the current boundaries are appropriate to protect marine wildlife of the Channel Islands.
- I hope you will consider extending the boundaries of the CINMS northward to meet the MBNMS and eastward to the mainland. The possibility of future oil exploration and development poses a threat to the CINMS. The seismic survey, oil spills and vessel traffic that will result from such exploration and development can cause damage to the ecosystems and disturb marine life within the Channel Islands
- Support for efforts to increase protections for the spectacular marine life of the CINMS. The new management plan should clearly address the impact pollution has on the Sanctuary's wildlife and water quality. The management plan should establish effective sea life reserves, areas where human activities are limited, within the sanctuary and the new plan should study whether the current boundaries are appropriate to protect the marine life of the Channel Islands.

A.2.1.2 Public Scoping Comments Synthesis - Organized by Issue Category

Many members of the public provided comments on the same topical areas, or issue categories. These included: water quality; education and outreach; research, monitoring and enforcement; boundary redefinition; military activity; oil and gas; marine reserves; sea otters; and other management issues. Please note that Sanctuary staff produced this synthesis of comments based on raw comments extracted from seven public scoping meetings (held from June to August, 1999) along with letters, faxes, and emails received during and after those meetings. The raw comments are provided above in section A.2.1.1.

Water Quality

Communities in which individuals provided scoping comments regarding water quality were: Lompoc, Santa Barbara, Oxnard, Long Beach, Ventura, and Washington, D.C. Comments regarding water quality were also received in written format. Specific comments included the following:

- Increase public awareness about water quality through education

- A no discharge zone for boats
- Need comprehensive coordinated strategy
- Concern over discharge from fishing vessels
- Make connection between watersheds and ocean systems
- Increase water quality data collection stations
- Sanctuary should partner with coastal watershed and water quality groups
- Impact on kelp from siltation, pollution, runoff
- Look at impacts on sanctuary from outside of boundaries
- Include provisions for prohibiting discharges outside of sanctuary boundaries that may impact sanctuary resources
- Be proactive about terrestrial water quality impacts (including from the Channel Islands)

Education and Outreach

Communities in which individuals provided scoping comments regarding education and outreach were: Lompoc, Santa Barbara, Oxnard, Long Beach, Ventura, and San Luis Obispo. Comments regarding education and outreach were also received in written format. Specific comments included the following:

- Better education about sanctuary boundaries and resources
- Better recreational diver education
- Maps showing resources, activities and issues
- Enhance outreach efforts to stimulate stewardship
- Should be top priority: more resources and activities, focus on primary schools, and outside of Santa Barbara
- Sanctuary should work to improve marine education in the public schools
- More education needed for yacht clubs

Research, Monitoring, and Enforcement

Communities in which individuals provided scoping comments regarding research, monitoring, and enforcement were: Lompoc, Santa Barbara, Oxnard, Long Beach, and San Luis Obispo. Comments regarding research, monitoring, and enforcement were also received in written format. Specific comments included the following:

- Increase monitoring and enforcement efforts
- Evaluate effectiveness of enforcement of regulations
- Research should include participation of fisherman
- Understand dynamism and our role in monitoring

- Use CalCOFI data and monitor between stations
- Conduct full inventory of species by habitat type, characterize habitat, assess health, look at natural fluctuations vs. human impacts
- Study impacts of commercial fishing on the resources
- Need to summarize research for decision makers and public

Boundary Redefinition

Communities in which individuals provided scoping comments regarding boundary redefinition were: Santa Barbara, Ventura, Washington, D.C., and San Luis Obispo. Comments regarding boundary redefinition were also received in written format. Specific comments included the following:

- Expand north to Santa Rosa Creek with goal of protecting biodiversity
- Expansion to include entire Channel and Santa Catalina Island (safety, efficiency, information exchange, protect environment)
- Expand north to protect ecosystem, dynamic province, strong upwelling components, spawning grounds
- Expand to coast to make connection between ocean and land
- New sanctuary between CINMS and MBNMS, concerned about offshore oil and fishing (Central Coast Sanctuary)
- Expand to include waters from Pt. Arguello to MBNMS
- North to include Santa Lucia Bank
- Include coastal waters of Santa Barbara County and San Luis Obispo County
- Boundaries are too arbitrary and don't address threats outside sanctuary
- Question on whether boundary redefinition would change the focus/mission of CINMS
- Need to create new sanctuary from Point Conception to Point Planca
- Does not support expansion of CINMS boundaries
- How would new boundaries be selected or developed
- Support for extending CINMS to include Central Coast islands
- Boundary expansion to Nipomo Dunes and Point Sal

Military Activity

Communities in which individuals provided scoping comments regarding military activity were: Lompoc, Santa Barbara, Oxnard, Long Beach, Ventura, and San Luis Obispo. Comments regarding military activity were also received in written format. Specific comments included the following:

- Evaluate military activity impacts on environment
- Concerned about expansion plans from Navy Sea Test Range

- Need protection from radar activity
- Military activities to avoid to the Maximum Extent Practicable any adverse impact to Sanctuary resources
- Should take into account and be ready for increase in military activity
- Concern about the impact of this technology on marine mammals
- The Navy objects to any proposed changes in the plan and regulations that would hinder their ability to train for combat readiness or weapon systems in support of national defense

Oil and Gas

Communities in which individuals provided scoping comments regarding oil and gas were: Lompoc, Santa Barbara, Oxnard, Long Beach, Ventura, Washington, D.C., and San Luis Obispo. Comments regarding oil and gas were also received in written format. Specific comments included the following:

- Evaluate impacts from oil drilling including vessel strikes, pipes, platform blowout, other accidents, potential for increased drilling, impacts on tourism
- Concern about oil/gas leases - include language (to maximize protection of the resources) in the reauthorization or renewal of existing leases
- Opposed to oil and gas development in the Channel
- Concerned about development of 40 oil and gas leases off of SLO County
- Slow down oil lease/platform development process
- Hazardous material spills resulting from activities within sanctuary boundaries, including leaks from commercial and recreational watercraft and spills from exploration or development activity could adversely affect any species and their prey bases

Marine Reserves

Communities in which individuals provided scoping comments regarding marine reserves were: Santa Barbara, Oxnard, Long Beach, Ventura, Washington, D.C., and San Luis Obispo. Comments regarding marine reserves were also received in written format. Specific comments included the following:

- Increase and/or establish no take zones to protect biodiversity
- Evaluate the impacts on the resources from commercial fisheries and consider no take zones as a management tool
- Marine reserves needed for the protection of sea otters/macroinvertebrates
- No take zones with limited access demonize certain activities, no take zones should be absolute, don't let anyone in except for navigation
- Need a comprehensive and complete management plan with research area - no take zones as ground truth areas for sampling
- Marine reserves issue needs to fundamentally be part of the management plan

- Propose to designate more ecological reserves within the sanctuary to protect marine biodiversity: maintain key processes in a relatively undisturbed manner, lessen impact of large scale disasters, increase understanding of marine environment, provide research opportunities
- Establish network of sea life reserves to promote biodiversity, improve scientific understanding, maintain areas of ocean as wilderness
- There are enough marine reserves in California

Sea Otters

Communities in which individuals provided scoping comments regarding sea otters were: Lompoc, Santa Barbara, Long Beach, Ventura, Washington, D.C. Comments regarding sea otters were also received in written format. Specific comments included the following:

- Sanctuary should take a position on the expanding range of the sea otter
- Evaluate accommodation and impacts of sea otters
- Marine reserves for the protection of sea otters
- Concern about protecting sea otters
- Otters will cause more conflicts with people who rely on the resources, CINMS should be prepared
- Need to consider sea otters as functional part of original community in Channel Islands and the roll of CINMS in reestablishing populations
- Concern about the impact of marine mammals on coastal and pelagic species

Other Management Issues

Communities in which individuals provided scoping comments regarding other management issues were: Lompoc, Santa Barbara, Long Beach, Ventura, Washington, D.C. Comments regarding other management issues were also received in written format. Specific comments included the following:

- Adopt ecosystem management policies that allow for the evaluation of sanctuary regulations and programs and adaptation to new information
- Clarify the financial resources needed to meet current and future management needs
- Sanctuary should focus on habitat needs including preservation and restoration
- Should work better with other regulatory agencies in managing the resources
- Any restrictions should be easy and logical for the public
- Keep access to the sanctuary open to the public, make it smart and protect the resources for future generations
- Incorporate performance standards
- Refocus on resource protection rather than use

- Resource management should be based on a thorough understanding of ecosystem vs. species by species management
- Should be mooring systems for boaters who visit islands
- Improve coordination with federal and state agencies, and establish new partnerships and better collaboration between agencies across state/federal jurisdictions
- Need to address habitat enhancement for endangered species, should be a priority over human use
- Need to address the threat non-native species pose to endangered species
- Need to recruit stewards of the sanctuary
- Concern about tanker traffic
- First priority for management plan should be emphasis on activities within current boundaries
- Concern about public being shut out of regulatory process
- Too many stakeholders, not all needs can be met
- Concern about personalized watercraft

A.2.2 ADDITIONAL OPPORTUNITIES TO COMMENT

CINMS welcomes your comments. Sanctuary constituents, including members of the general public, have additional opportunities to comment on the management plan revision process:

The Sanctuary Advisory Council (SAC)

The SAC is composed of forty individuals representing various constituent groups and government agencies. The SAC provides a variety of opportunities for the public to comment on the management plan revision: commenting during public comment periods at bi-monthly SAC meetings, speaking to the SAC member(s) representing their interest area(s), or by applying to participate directly in the SAC as one of its members.

Public hearings

CINMS will host a series of public hearings after releasing the draft management plan and draft environmental impact statement (DEIS) to the public. Notices with information about public hearings will be posted in the Federal Register and also on the Sanctuary's website: <http://channelislands.nos.noaa.gov/welcome.html>.

Contact Sanctuary Management Plan Staff

CINMS welcomes your comments and questions about the management plan revision. Members of the public are welcome to contact our staff at any time using the information provided below. Thank you for taking the time to review these important planning documents and for providing your comments to us.

Management Plan Staff:

Management Plan Coordinator
Michael Murray
Phone: (805) 884-1464
Email: michael.murray@noaa.gov

Management Plan Specialist
Sarah MacWilliams
Phone: (805) 884-1469
Email: sarah.macwilliams@noaa.gov

Sanctuary Mailing Address/Fax/Phone

Channel Islands National Marine Sanctuary
113 Harbor Way, Suite 150
Santa Barbara, CA 93109
Fax: (805) 568-1582
Phone: (805) 966-7107

Sanctuary Management Plan Website

<http://channelislands.nos.noaa.gov/manplan/overview.html>

B NATIONAL MARINE SANCTUARIES ACT

APPENDIX B

NATIONAL MARINE SANCTUARIES ACT

*Title 16, Chapter 32, Sections 1431 et seq. United States Code
As amended by Public Law 106-513, November 2000*

SEC. 301. [16 U.S.C. 1431] FINDINGS, PURPOSES, AND POLICIES; ESTABLISHMENT OF SYSTEM..B2
 SEC. 302. [16 U.S.C. 1432] DEFINITIONSB3
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**SEC. 301. [16 U.S.C. 1431] FINDINGS, PURPOSES, AND POLICIES;
ESTABLISHMENT OF SYSTEM**

(a) FINDINGS.—The Congress finds that—

(1) this Nation historically has recognized the importance of protecting special areas of its public domain, but these efforts have been directed almost exclusively to land areas above the high-water mark;

(2) certain areas of the marine environment possess conservation, recreational, ecological, historical, scientific, educational, cultural, archeological, or esthetic qualities which give them special national, and in some cases international, significance;

(3) while the need to control the effects of particular activities has led to enactment of resource-specific legislation, these laws cannot in all cases provide a coordinated and comprehensive approach to the conservation and management of special areas of the marine environment; and

(4) a Federal program which establishes areas of the marine environment which have special conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, or esthetic qualities as national marine sanctuaries managed as the National Marine Sanctuary System will—

(A) improve the conservation, understanding, management, and wise and sustainable use of marine resources;

(B) enhance public awareness, understanding, and appreciation of the marine environment; and

(C) maintain for future generations the habitat, and ecological services, of the natural assemblage of living resources that inhabit these areas.

(b) Purposes and Policies.—The purposes and policies of this chapter are-

(1) to identify and designate as national marine sanctuaries areas of the marine environment which are of special national significance and to manage these areas as the National Marine Sanctuary System;

(2) to provide authority for comprehensive and coordinated conservation and management of these marine areas, and activities affecting them, in a manner which complements existing regulatory authorities;

(3) to maintain the natural biological communities in the national marine sanctuaries, and to protect, and, where appropriate, restore and enhance natural habitats, populations, and ecological processes;

(4) to enhance public awareness, understanding, appreciation, and wise and sustainable use of the marine environment, and the natural, historical, cultural, and archeological resources of the National Marine Sanctuary System;

(5) to support, promote, and coordinate scientific research on, and long-term monitoring of, the resources of these marine areas;

(6) to facilitate to the extent compatible with the primary objective of resource protection, all public and private uses of the resources of these marine areas not prohibited pursuant to other authorities;

(7) to develop and implement coordinated plans for the protection and management of these areas with appropriate Federal agencies, State and local governments, Native American tribes and organizations, international organizations, and other public and private interests concerned with the continuing health and resilience of these marine areas;

(8) to create models of, and incentives for, ways to conserve and manage these areas, including the application of innovative management techniques; and

(9) to cooperate with global programs encouraging conservation of marine resources.

(c) Establishment of System.—There is established the National Marine Sanctuary System, which shall consist of national marine sanctuaries designated by the Secretary in accordance with this chapter.

SEC. 302. [16 U.S.C. 1432] DEFINITIONS

As used in this chapter, the term—

- (1) “draft management plan” means the plan described in section 1434(a)(1)(C)(v) of this title;
- (2) “Magnuson-Stevens Act” means the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1801 et seq.);
- (3) “marine environment” means those areas of coastal and ocean waters, the Great Lakes and their connecting waters, and submerged lands over which the United States exercises jurisdiction, including the exclusive economic zone, consistent with international law;
- (4) “Secretary” means the Secretary of Commerce;
- (5) “State” means each of the several States, the District of Columbia, the Commonwealth of Puerto Rico, the Commonwealth of the Northern Mariana Islands, American Samoa, the Virgin Islands, Guam, and any other commonwealth, territory, or possession of the United States;
- (6) “damages” includes—
 - (A) compensation for—
 - (i)(I) the cost of replacing, restoring, or acquiring the equivalent of a sanctuary resource; and (II) the value of the lost use of a sanctuary resource pending its restoration or replacement or the acquisition of an equivalent sanctuary resource; or
 - (ii) the value of a sanctuary resource if the sanctuary resource cannot be restored or replaced or if the equivalent of such resource cannot be acquired;
 - (B) the cost of damage assessments under section 1443(b)(2) of this title;
 - (C) the reasonable cost of monitoring appropriate to the injured, restored, or replaced resources;
 - (D) the cost of curation and conservation of archeological, historical, and cultural sanctuary resources; and
 - (E) the cost of enforcement actions undertaken by the Secretary in response to the destruction or loss of, or injury to, a sanctuary resource;
- (7) “response costs” means the costs of actions taken or authorized by the Secretary to minimize destruction or loss of, or injury to, sanctuary resources, or to minimize the imminent risks of such destruction, loss, or injury, including costs related to seizure, forfeiture, storage, or disposal arising from liability under section 1443 of this title;
- (8) “sanctuary resource” means any living or nonliving resource of a national marine sanctuary that contributes to the conservation, recreational, ecological, historical, educational, cultural, archeological, scientific, or aesthetic value of the sanctuary; and
- (9) “exclusive economic zone” means the exclusive economic zone as defined in the Magnuson-Stevens Act; and
- (10) “System” means the National Marine Sanctuary System established by section 1431 of this title.

SEC. 303. [16 U.S.C. 1433] SANCTUARY DESIGNATION STANDARDS

(a) Standards.—The Secretary may designate any discrete area of the marine environment as a national marine sanctuary and promulgate regulations implementing the designation if the

Secretary determines that—

- (1) the designation will fulfill the purposes and policies of this chapter;
- (2) the area is of special national significance due to—
 - (A) its conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or esthetic qualities;
 - (B) the communities of living marine resources it harbors; or
 - (C) its resource or human-use values;
- (3) existing State and Federal authorities are inadequate or should be supplemented to ensure coordinated and comprehensive conservation and management of the area, including resource protection, scientific research, and public education;
- (4) designation of the area as a national marine sanctuary will facilitate the objectives stated in paragraph (3); and
- (5) the area is of a size and nature that will permit comprehensive and coordinated conservation and management.

(b) Factors and Consultations Required in Making Determinations and Findings.—

(1) Factors.—For purposes of determining if an area of the marine environment meets the standards set forth in subsection (a) of this section, the Secretary shall consider—

- (A) the area's natural resource and ecological qualities, including its contribution to biological productivity, maintenance of ecosystem structure, maintenance of ecologically or commercially important or threatened species or species assemblages, maintenance of critical habitat of endangered species, and the biogeographic representation of the site;
- (B) the area's historical, cultural, archaeological, or paleontological significance;
- (C) the present and potential uses of the area that depend on maintenance of the area's resources, including commercial and recreational fishing, subsistence uses, other commercial and recreational activities, and research and education;
- (D) the present and potential activities that may adversely affect the factors identified in subparagraphs (A), (B), and (C);
- (E) the existing State and Federal regulatory and management authorities applicable to the area and the adequacy of those authorities to fulfill the purposes and policies of this chapter;
- (F) the manageability of the area, including such factors as its size, its ability to be identified as a discrete ecological unit with definable boundaries, its accessibility, and its suitability for monitoring and enforcement activities;
- (G) the public benefits to be derived from sanctuary status, with emphasis on the benefits of long-term protection of nationally significant resources, vital habitats, and resources which generate tourism;
- (H) the negative impacts produced by management restrictions on income-generating activities such as living and nonliving resources development;
- (I) the socioeconomic effects of sanctuary designation;
- (J) the area's scientific value and value for monitoring the resources and natural processes that occur there;
- (K) the feasibility, where appropriate, of employing innovative management approaches to protect sanctuary resources or to manage compatible uses; and
- (L) the value of the area as an addition to the System.

(2) Consultation.—In making determinations and findings, the Secretary shall consult with—

- (A) the Committee on Resources of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate;

- (B) the Secretaries of State, Defense, Transportation, and the Interior, the Administrator, and the heads of other interested Federal agencies;
- (C) the responsible officials or relevant agency heads of the appropriate State and local government entities, including coastal zone management agencies, that will or are likely to be affected by the establishment of the area as a national marine sanctuary;
- (D) the appropriate officials of any Regional Fishery Management Council established by section 302 of the Magnuson-Stevens Act (16 U.S.C. 1852) that may be affected by the proposed designation; and
- (E) other interested persons.

SEC. 304. [16 U.S.C. 1434] PROCEDURES FOR DESIGNATION AND IMPLEMENTATION

(a) Sanctuary Proposal.—

(1) Notice.—In proposing to designate a national marine sanctuary, the Secretary shall—

(A) issue, in the Federal Register, a notice of the proposal, proposed regulations that may be necessary and reasonable to implement the proposal, and a summary of the draft management plan;

(B) provide notice of the proposal in newspapers of general circulation or electronic media in the communities that may be affected by the proposal; and

(C) no later than the day on which the notice required under subparagraph (A) is submitted to the Office of the Federal Register, submit a copy of that notice and the draft sanctuary designation documents prepared pursuant to paragraph (2), including an executive summary, to the Committee on Resources of the House of Representatives, the Committee on Commerce, Science, and Transportation of the Senate, and the Governor of each State in which any part of the proposed sanctuary would be located.

(2) Sanctuary designation documents.—The Secretary shall prepare and make available to the public sanctuary designation documents on the proposal that include the following:

(A) A draft environmental impact statement pursuant to the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.).

(B) A resource assessment that documents—

(i) present and potential uses of the area, including commercial and recreational fishing, research and education, minerals and energy development, subsistence uses, and other commercial, governmental, or recreational uses;

(ii) after consultation with the Secretary of the Interior, any commercial, governmental, or recreational resource uses in the areas that are subject to the primary jurisdiction of the Department of the Interior; and

(iii) information prepared in consultation with the Secretary of Defense, the Secretary of Energy, and the Administrator of the Environmental Protection Agency, on any past, present, or proposed future disposal or discharge of materials in the vicinity of the proposed sanctuary. Public disclosure by the Secretary of such information shall be consistent with national security regulations.

(C) A draft management plan for the proposed national marine sanctuary that includes the following:

(i) The terms of the proposed designation.

(ii) Proposed mechanisms to coordinate existing regulatory and management authorities within

the area.

(iii) The proposed goals and objectives, management responsibilities, resource studies, and appropriate strategies for managing sanctuary resources of the proposed sanctuary, including interpretation and education, innovative management strategies, research, monitoring and assessment, resource protection, restoration, enforcement, and surveillance activities.

(iv) An evaluation of the advantages of cooperative State and Federal management if all or part of the proposed sanctuary is within the territorial limits of any State or is superjacent to the subsoil and seabed within the seaward boundary of a State, as that boundary is established under the Submerged Lands Act (43 U.S.C. 1301 et seq.).

(v) An estimate of the annual cost to the Federal Government of the proposed designation, including costs of personnel, equipment and facilities, enforcement, research, and public education.

(vi) The proposed regulations referred to in paragraph (1)(A).

(D) Maps depicting the boundaries of the proposed sanctuary.

(E) The basis for the determinations made under section 1433(a) of this title with respect to the area.

(F) An assessment of the considerations under section 1433(b)(1) of this title.

(3) Public hearing.—No sooner than thirty days after issuing a notice under this subsection, the Secretary shall hold at least one public hearing in the coastal area or areas that will be most affected by the proposed designation of the area as a national marine sanctuary for the purpose of receiving the views of interested parties.

(4) Terms of designation.—The terms of designation of a sanctuary shall include the geographic area proposed to be included within the sanctuary, the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational, or esthetic value, and the types of activities that will be subject to regulation by the Secretary to protect those characteristics. The terms of designation may be modified only by the same procedures by which the original designation is made.

(5) Fishing regulations.—The Secretary shall provide the appropriate Regional Fishery Management Council with the opportunity to prepare draft regulations for fishing within the Exclusive Economic Zone as the Council may deem necessary to implement the proposed designation. Draft regulations prepared by the Council, or a Council determination that regulations are not necessary pursuant to this paragraph, shall be accepted and issued as proposed regulations by the Secretary unless the Secretary finds that the Council's action fails to fulfill the purposes and policies of this chapter and the goals and objectives of the proposed designation. In preparing the draft regulations, a Regional Fishery Management Council shall use as guidance the national standards of section 301(a) of the Magnuson-Stevens Act (16 U.S.C. 1851) to the extent that the standards are consistent and compatible with the goals and objectives of the proposed designation. The Secretary shall prepare the fishing regulations, if the Council declines to make a determination with respect to the need for regulations, makes a determination which is rejected by the Secretary, or fails to prepare the draft regulations in a timely manner. Any amendments to the fishing regulations shall be drafted, approved, and issued in the same manner as the original regulations. The Secretary shall also cooperate with other appropriate fishery management authorities with rights or responsibilities within a proposed sanctuary at the earliest practicable stage in drafting any sanctuary fishing regulations.

(6) Committee action.—After receiving the documents under subsection (a)(1)(C) of this section, the Committee on Resources of the House of Representatives and the Committee on Commerce,

Science, and Transportation of the Senate may each hold hearings on the proposed designation and on the matters set forth in the documents. If within the forty-five day period of continuous session of Congress beginning on the date of submission of the documents, either Committee issues a report concerning matters addressed in the documents, the Secretary shall consider this report before publishing a notice to designate the national marine sanctuary.

(b) Taking Effect of Designations.—

(1) Notice.—In designating a national marine sanctuary, the Secretary shall publish in the Federal Register notice of the designation together with final regulations to implement the designation and any other matters required by law, and submit such notice to the Congress. The Secretary shall advise the public of the availability of the final management plan and the final environmental impact statement with respect to such sanctuary. The Secretary shall issue a notice of designation with respect to a proposed national marine sanctuary site not later than 30 months after the date a notice declaring the site to be an active candidate for sanctuary designation is published in the Federal Register under regulations issued under this Act, or shall publish not later than such date in the Federal Register findings regarding why such notice has not been published. No notice of designation may occur until the expiration of the period for Committee action under subsection (a)(6) of this section. The designation (and any of its terms not disapproved under this subsection) and regulations shall take effect and become final after the close of a review period of forty-five days of continuous session of Congress beginning on the day on which such notice is published unless, in the case of a national marine sanctuary that is located partially or entirely within the seaward boundary of any State, the Governor affected certifies to the Secretary that the designation or any of its terms is unacceptable, in which case the designation or the unacceptable term shall not take effect in the area of the sanctuary lying within the seaward boundary of the State.

(2) Withdrawal of designation.—If the Secretary considers that actions taken under paragraph (1) will affect the designation of a national marine sanctuary in a manner that the goals and objectives of the sanctuary or System cannot be fulfilled, the Secretary may withdraw the entire designation. If the Secretary does not withdraw the designation, only those terms of the designation not certified under paragraph (1) shall take effect.

(3) Procedures.—In computing the forty-five-day periods of continuous session of Congress pursuant to subsection (a)(6) of this section and paragraph (1) of this subsection—

- (A) continuity of session is broken only by an adjournment of Congress sine die; and
- (B) the days on which either House of Congress is not in session because of an adjournment of more than three days to a day certain are excluded.

(c) Access and Valid Rights.—

(1) Nothing in this chapter shall be construed as terminating or granting to the Secretary the right to terminate any valid lease, permit, license, or right of subsistence use or of access that is in existence on the date of designation of any national marine sanctuary.

(2) The exercise of a lease, permit, license, or right is subject to regulation by the Secretary consistent with the purposes for which the sanctuary is designated.

(d) Interagency Cooperation.—

(1) Review of agency actions.—

(A) In general.—Federal agency actions internal or external to a national marine sanctuary, including private activities authorized by licenses, leases, or permits, that are likely to destroy, cause the loss of, or injure any sanctuary resource are subject to consultation with the Secretary.

(B) Agency statements required.—Subject to any regulations the Secretary may establish each Federal agency proposing an action described in subparagraph (A) shall provide the Secretary with a written statement describing the action and its potential effects on sanctuary resources at the earliest practicable time, but in no case later than 45 days before the final approval of the action unless such Federal agency and the Secretary agree to a different schedule.

(2) Secretary's recommended alternatives.—If the Secretary finds that a Federal agency action is likely to destroy, cause the loss of, or injure a sanctuary resource, the Secretary shall (within 45 days of receipt of complete information on the proposed agency action) recommend reasonable and prudent alternatives, which may include conduct of the action elsewhere, which can be taken by the Federal agency in implementing the agency action that will protect sanctuary resources.

(3) Response to recommendations.—The agency head who receives the Secretary's recommended alternatives under paragraph (2) shall promptly consult with the Secretary on the alternatives. If the agency head decides not to follow the alternatives, the agency head shall provide the Secretary with a written statement explaining the reasons for that decision.

(4) Failure to follow alternative.—If the head of a Federal agency takes an action other than an alternative recommended by the Secretary and such action results in the destruction of, loss of, or injury to a sanctuary resource, the head of the agency shall promptly prevent and mitigate further damage and restore or replace the sanctuary resource in a manner approved by the Secretary.

(e) Review of Management Plans.—Not more than five years after the date of designation of any national marine sanctuary, and thereafter at intervals not exceeding five years, the Secretary shall evaluate the substantive progress toward implementing the management plan and goals for the sanctuary, especially the effectiveness of site-specific management techniques and strategies, and shall revise the management plan and regulations as necessary to fulfill the purposes and policies of this chapter. This review shall include a prioritization of management objectives.

(f) Limitation on Designation of New Sanctuaries.—

(1) Finding required.—The Secretary may not publish in the Federal Register any sanctuary designation notice or regulations proposing to designate a new sanctuary, unless the Secretary has published a finding that—

(A) the addition of a new sanctuary will not have a negative impact on the System; and

(B) sufficient resources were available in the fiscal year in which the finding is made to –

(i) effectively implement sanctuary management plans for each sanctuary in the System; and

(ii) complete site characterization studies and inventory known sanctuary resources, including cultural resources, for each sanctuary in the System within 10 years after the date that the finding is made if the resources available for those activities are maintained at the same level for each fiscal year in that 10 year period.

(2) Deadline.—If the Secretary does not submit the findings required by paragraph (1) before February 1, 2004, the Secretary shall submit to the Congress before October 1, 2004, a finding with respect to whether the requirements of subparagraphs (A) and (B) of paragraph (1) have been met by all existing sanctuaries.

(3) Limitation on application.—Paragraph (1) does not apply to any sanctuary designation documents for—

(A) a Thunder Bay National Marine Sanctuary; or

(B) a Northwestern Hawaiian Islands National Marine Sanctuary.

SEC. 305. [16 U.S.C. 1435] APPLICATION OF REGULATIONS; INTERNATIONAL NEGOTIATIONS AND COOPERATION

(a) Regulations.—This chapter and the regulations issued under section 1434 of this title shall be applied in accordance with generally recognized principles of international law, and in accordance with treaties, conventions, and other agreements to which the United States is a party. No regulation shall apply to or be enforced against a person who is not a citizen, national, or resident alien of the United States, unless in accordance with—

(1) generally recognized principles of international law;

(2) an agreement between the United States and the foreign state of which the person is a citizen; or

(3) an agreement between the United States and the flag state of a foreign vessel, if the person is a crewmember of the vessel.

(b) Negotiations.—The Secretary of State, in consultation with the Secretary, shall take appropriate action to enter into negotiations with other governments to make necessary arrangements for the protection of any national marine sanctuary and to promote the purposes for which the sanctuary is established.

(c) International Cooperation.—The Secretary, in consultation with the Secretary of State and other appropriate Federal agencies, shall cooperate with other governments and international organizations in furtherance of the purposes and policies of this chapter and consistent with applicable regional and multilateral arrangements for the protection and management of special marine areas.

SEC. 306. [16 U.S.C. 1436] PROHIBITED ACTIVITIES

It is unlawful for any person to—

(1) destroy, cause the loss of, or injure any sanctuary resource managed under law or regulations for that sanctuary;

(2) possess, sell, offer for sale, purchase, import, export, deliver, carry, transport, or ship by any means any sanctuary resource taken in violation of this section;

(3) interfere with the enforcement of this chapter by—

(A) refusing to permit any officer authorized to enforce this chapter to board a vessel, other than a vessel operated by the Department of Defense or United States Coast Guard, subject to such person's control for the purposes of conducting any search or inspection in connection with the enforcement of this chapter;

(B) resisting, opposing, impeding, intimidating, harassing, bribing, interfering with, or forcibly assaulting any person authorized by the Secretary to implement this chapter or any such authorized officer in the conduct of any search or inspection performed under this chapter; or

(C) knowingly and willfully submitting false information to the Secretary or any officer authorized to enforce this chapter in connection with any search or inspection conducted under this chapter; or

(4) violate any provision of this chapter or any regulation or permit issued pursuant to this chapter.

SEC. 307. [16 U.S.C. 1437] ENFORCEMENT

(a) In General.—The Secretary shall conduct such enforcement activities as are necessary and reasonable to carry out this chapter.

(b) Powers of Authorized Officers.—Any person who is authorized to enforce this chapter may—

(1) board, search, inspect, and seize any vessel suspected of being used to violate this chapter or any regulation or permit issued under this chapter and any equipment, stores, and cargo of such vessel;

(2) seize wherever found any sanctuary resource taken or retained in violation of this chapter or any regulation or permit issued under this chapter;

(3) seize any evidence of a violation of this chapter or of any regulation or permit issued under this chapter;

(4) execute any warrant or other process issued by any court of competent jurisdiction;

(5) exercise any other lawful authority; and

(6) arrest any person, if there is reasonable cause to believe that such person has committed an act prohibited by section 1436(3) of this title.

(c) Criminal Offenses.—

(1) Offenses.—A person is guilty of an offense under this subsection if the person commits any act prohibited by section 1436(3) of this title.

(2) Punishment.—Any person that is guilty of an offense under this subsection—

(A) except as provided in subparagraph (B), shall be fined under title 18, imprisoned for not more than 6 months, or both; or

(B) in the case of a person who in the commission of such an offense uses a dangerous weapon, engages in conduct that causes bodily injury to any person authorized to enforce this chapter or any person authorized to implement the provisions of this chapter, or places any such person in fear of imminent bodily injury, shall be fined under title 18, imprisoned for not more than 10 years, or both.

(d) Civil Penalties.—

(1) Civil penalty.—Any person subject to the jurisdiction of the United States who violates this chapter or any regulation or permit issued under this chapter shall be liable to the United States for a civil penalty of not more than \$100,000 for each such violation, to be assessed by the Secretary. Each day of a continuing violation shall constitute a separate violation.

(2) Notice.—No penalty shall be assessed under this subsection until after the person charged has been given notice and an opportunity for a hearing.

(3) In rem jurisdiction.—A vessel used in violating this chapter or any regulation or permit issued under this chapter shall be liable in rem for any civil penalty assessed for such violation. Such penalty shall constitute a maritime lien on the vessel and may be recovered in an action in rem in the district court of the United States having jurisdiction over the vessel.

(4) Review of civil penalty.—Any person against whom a civil penalty is assessed under this subsection may obtain review in the United States district court for the appropriate district by filing a complaint in such court not later than 30 days after the date of such order.

(5) Collection of penalties.—If any person fails to pay an assessment of a civil penalty under this section after it has become a final and unappealable order, or after the appropriate court has entered final judgment in favor of the Secretary, the Secretary shall refer the matter to the Attorney General, who shall recover the amount assessed in any appropriate district court of the United States. In such action, the validity and appropriateness of the final order imposing the civil penalty shall not be subject to review.

(6) Compromise or other action by Secretary.—The Secretary may compromise, modify, or remit, with or without conditions, any civil penalty which is or may be imposed under this section.

(e) Forfeiture.—

(1) In general.—Any vessel (including the vessel's equipment, stores, and cargo) and other item used, and any sanctuary resource taken or retained, in any manner, in connection with or as a result of any violation of this chapter or of any regulation or permit issued under this chapter shall be subject to forfeiture to the United States pursuant to a civil proceeding under this subsection. The proceeds from forfeiture actions under this subsection shall constitute a separate recovery in addition to any amounts recovered as civil penalties under this section or as civil damages under section 1443 of this title. None of those proceeds shall be subject to set-off.

(2) Application of the customs laws.—The Secretary may exercise the authority of any United States official granted by any relevant customs law relating to the seizure, forfeiture, condemnation, disposition, remission, and mitigation of property in enforcing this chapter.

(3) Disposal of sanctuary resources.—Any sanctuary resource seized pursuant to this chapter may be disposed of pursuant to an order of the appropriate court, or, if perishable, in a manner prescribed by regulations promulgated by the Secretary. Any proceeds from the sale of such sanctuary resource shall for all purposes represent the sanctuary resource so disposed of in any subsequent legal proceedings.

(4) Presumption.—For the purposes of this section there is a rebuttable presumption that all sanctuary resources found on board a vessel that is used or seized in connection with a violation of this chapter or of any regulation or permit issued under this chapter were taken or retained in violation of this chapter or of a regulation or permit issued under this chapter.

(f) Payment of Storage, Care, and Other Costs.—

(1) Expenditures.—

(A) Notwithstanding any other law, amounts received by the United States as civil penalties, forfeitures of property, and costs imposed under paragraph (2) shall be retained by the Secretary in the manner provided for in section 9607(f)(1) of title 42.

(B) Amounts received under this section for forfeitures and costs imposed under paragraph (2) shall be used to pay the reasonable and necessary costs incurred by the Secretary to provide temporary storage, care, maintenance, and disposal of any sanctuary resource or other property seized in connection with a violation of this chapter or any regulation or permit issued under this chapter.

(C) Amounts received under this section as civil penalties and any amounts remaining after the operation of subparagraph (B) shall be used, in order of priority, to—

(i) manage and improve the national marine sanctuary with respect to which the violation occurred that resulted in the penalty or forfeiture;

(ii) pay a reward to any person who furnishes information leading to an assessment of a civil penalty, or to a forfeiture of property, for a violation of this chapter or any regulation or permit issued under this chapter; and

(iii) manage and improve any other national marine sanctuary.

(2) Liability for costs.—Any person assessed a civil penalty for a violation of this chapter or of any regulation or permit issued under this chapter, and any claimant in a forfeiture action brought for such a violation, shall be liable for the reasonable costs incurred by the Secretary in storage, care, and maintenance of any sanctuary resource or other property seized in connection with the violation.

(g) Subpoenas.—In the case of any hearing under this section which is determined on the record in accordance with the procedures provided for under section 554 of title 5, the Secretary may issue subpoenas for the attendance and testimony of witnesses and the production of relevant

papers, books, electronic files, and documents, and may administer oaths.

(h) Use of Resources of State and Other Federal Agencies.—The Secretary shall, whenever appropriate, use by agreement the personnel, services, and facilities of State and other Federal departments, agencies, and instrumentalities, on a reimbursable or nonreimbursable basis, to carry out the Secretary's responsibilities under this section.

(i) Coast Guard Authority Not Limited.—Nothing in this section shall be considered to limit the authority of the Coast Guard to enforce this or any other Federal law under section 89 of title 14.

(j) Injunctive Relief.—If the Secretary determines that there is an imminent risk of destruction or loss of or injury to a sanctuary resource, or that there has been actual destruction or loss of, or injury to, a sanctuary resource which may give rise to liability under section 1443 of this title, the Attorney General, upon request of the Secretary, shall seek to obtain such relief as may be necessary to abate such risk or actual destruction, loss, or injury, or to restore or replace the sanctuary resource, or both. The district courts of the United States shall have jurisdiction in such a case to order such relief as the public interest and the equities of the case may require.

(k) Area of Application and Enforceability.—The area of application and enforceability of this chapter includes the territorial sea of the United States, as described in Presidential Proclamation 5928 of December 27, 1988, which is subject to the sovereignty of the United States, and the United States exclusive economic zone, consistent with international law.

(l) Nationwide Service of Process.—In any action by the United States under this chapter, process may be served in any district where the defendant is found, resides, transacts business, or has appointed an agent for the service of process.

SEC. 308. [16 U.S.C. 1439] REGULATIONS

The Secretary may issue such regulations as may be necessary to carry out this chapter.

SEC. 309. [16 U.S.C. 1440] RESEARCH, MONITORING, AND EDUCATION

(a) In General.—The Secretary shall conduct, support, or coordinate research, monitoring, evaluation, and education programs consistent with subsections (b) and (c) of this section and the purposes and policies of this chapter.

(b) Research and Monitoring.—

(1) In general.—The Secretary may—

(A) support, promote, and coordinate research on, and long-term monitoring of, sanctuary resources and natural processes that occur in national marine sanctuaries, including exploration, mapping, and environmental and socioeconomic assessment;

(B) develop and test methods to enhance degraded habitats or restore damaged, injured, or lost sanctuary resources; and

(C) support, promote, and coordinate research on, and the conservation, curation, and public display of, the cultural, archeological, and historical resources of national marine sanctuaries.

(2) Availability of results.—The results of research and monitoring conducted, supported, or permitted by the Secretary under this subsection shall be made available to the public.

(c) Education.—

(1) In general.—The Secretary may support, promote, and coordinate efforts to enhance public awareness, understanding, and appreciation of national marine sanctuaries and the System. Efforts supported, promoted, or coordinated under this subsection must emphasize the conservation goals and sustainable public uses of national marine sanctuaries and the System.

(2) Educational activities.—Activities under this subsection may include education of the

general public, teachers, students, national marine sanctuary users, and ocean and coastal resource managers.

(d) Interpretive Facilities.—

(1) In general.—The Secretary may develop interpretive facilities near any national marine sanctuary.

(2) Facility requirement.—Any facility developed under this subsection must emphasize the conservation goals and sustainable public uses of national marine sanctuaries by providing the public with information about the conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, or esthetic qualities of the national marine sanctuary.

(e) Consultation and Coordination.—In conducting, supporting, and coordinating research, monitoring, evaluation, and education programs under subsection (a) of this section and developing interpretive facilities under subsection (d) of this section, the Secretary may consult or coordinate with Federal, interstate, or regional agencies, States or local governments.

SEC. 310. [16 U.S.C. 1441] SPECIAL USE PERMITS

(a) Issuance of Permits.—The Secretary may issue special use permits which authorize the conduct of specific activities in a national marine sanctuary if the Secretary determines such authorization is necessary—

(1) to establish conditions of access to and use of any sanctuary resource; or

(2) to promote public use and understanding of a sanctuary resource.

(b) Public Notice Required.—The Secretary shall provide appropriate public notice before identifying any category of activity subject to a special use permit under subsection (a) of this section.

(c) Permit Terms.—A permit issued under this section—

(1) shall authorize the conduct of an activity only if that activity is compatible with the purposes for which the sanctuary is designated and with protection of sanctuary resources;

(2) shall not authorize the conduct of any activity for a period of more than 5 years unless renewed by the Secretary;

(3) shall require that activities carried out under the permit be conducted in a manner that does not destroy, cause the loss of, or injure sanctuary resources; and

(4) shall require the permittee to purchase and maintain comprehensive general liability insurance, or post an equivalent bond, against claims arising out of activities conducted under the permit and to agree to hold the United States harmless against such claims.

(d) Fees.—

(1) Assessment and collection.—The Secretary may assess and collect fees for the conduct of any activity under a permit issued under this section.

(2) Amount.—The amount of a fee under this subsection shall be equal to the sum of—

(A) costs incurred, or expected to be incurred, by the Secretary in issuing the permit;

(B) costs incurred, or expected to be incurred, by the Secretary as a direct result of the conduct of the activity for which the permit is issued, including costs of monitoring the conduct of the activity; and

(C) an amount which represents the fair market value of the use of the sanctuary resource.

(3) Use of fees.—Amounts collected by the Secretary in the form of fees under this section may be used by the Secretary—

(A) for issuing and administering permits under this section; and

(B) for expenses of managing national marine sanctuaries.

(4) Waiver or reduction of fees.—The Secretary may accept in-kind contributions in lieu of a fee under paragraph (2)(C), or waive or reduce any fee assessed under this subsection for any activity that does not derive profit from the access to or use of sanctuary resources.

(e) Violations.—Upon violation of a term or condition of a permit issued under this section, the Secretary may—

(1) suspend or revoke the permit without compensation to the permittee and without liability to the United States;

(2) assess a civil penalty in accordance with section 1437 of this title; or

(3) both.

(f) Reports.—Each person issued a permit under this section shall submit an annual report to the Secretary not later than December 31 of each year which describes activities conducted under that permit and revenues derived from such activities during the year.

(g) Fishing.—Nothing in this section shall be considered to require a person to obtain a permit under this section for the conduct of any fishing activities in a national marine sanctuary.

SEC. 311. [16 U.S.C. 1442] COOPERATIVE AGREEMENTS, DONATIONS, AND ACQUISITIONS

(a) Agreements and Grants.—The Secretary may enter into cooperative agreements, contracts, or other agreements with, or make grants to, States, local governments, regional agencies, interstate agencies, or other persons to carry out the purposes and policies of this chapter.

(b) Authorization to Solicit Donations.—The Secretary may enter into such agreements with any nonprofit organization authorizing the organization to solicit private donations to carry out the purposes and policies of this chapter.

(c) Donations.—The Secretary may accept donations of funds, property, and services for use in designating and administering national marine sanctuaries under this chapter. Donations accepted under this section shall be considered as a gift or bequest to or for the use of the United States.

(d) Acquisitions.—The Secretary may acquire by purchase, lease, or exchange, any land, facilities, or other property necessary and appropriate to carry out the purposes and policies of this chapter.

(e) Use of Resources of Other Government Agencies.—The Secretary may, whenever appropriate, enter into an agreement with a State or other Federal agency to use the personnel, services, or facilities of such agency on a reimbursable or nonreimbursable basis, to assist in carrying out the purposes and policies of this chapter.

(f) Authority to Obtain Grants.—Notwithstanding any other provision of law that prohibits a Federal agency from receiving assistance, the Secretary may apply for, accept, and use grants from other Federal agencies, States, local governments, regional agencies, interstate agencies, foundations, or other persons, to carry out the purposes and policies of this chapter.

SEC. 312. [16 U.S.C. 1443] DESTRUCTION OR LOSS OF, OR INJURY TO, SANCTUARY RESOURCES

(a) Liability.—

(1) Liability to United States.—Any person who destroys, causes the loss of, or injures any sanctuary resource is liable to the United States for an amount equal to the sum of—

(A) the amount of response costs and damages resulting from the destruction, loss, or injury; and

(B) interest on that amount calculated in the manner described under section 2705 of title 33.

(2) Liability in rem.—Any vessel used to destroy, cause the loss of, or injure any sanctuary resource shall be liable in rem to the United States for response costs and damages resulting from such destruction, loss, or injury. The amount of that liability shall constitute a maritime lien on the vessel and may be recovered in an action in rem in any district court of the United States that has jurisdiction over the vessel.

(3) Defenses.—A person is not liable under this subsection if that person establishes that—

(A) the destruction or loss of, or injury to, the sanctuary resource was caused solely by an act of God, an act of war, or an act or omission of a third party, and the person acted with due care;

(B) the destruction, loss, or injury was caused by an activity authorized by Federal or State law; or

(C) the destruction, loss, or injury was negligible.

(4) Limits to liability.—Nothing in sections 181 to 188 of title 46, Appendix, or section 192 of title 46, Appendix, shall limit the liability of any person under this chapter.

(b) Response actions and Damage Assessment.—

(1) Response actions.—The Secretary may undertake or authorize all necessary actions to prevent or minimize the destruction or loss of, or injury to, sanctuary resources, or to minimize the imminent risk of such destruction, loss, or injury.

(2) Damage assessment.—The Secretary shall assess damages to sanctuary resources in accordance with section 1432(6) of this title.

(c) Civil Actions for Response Costs and Damages.—

(1) The Attorney General, upon request of the Secretary, may commence a civil action against any person or vessel who may be liable under subsection (a) of this section for response costs and damages. The Secretary, acting as trustee for sanctuary resources for the United States, shall submit a request for such an action to the Attorney General whenever a person may be liable for such costs or damages.

(2) An action under this subsection may be brought in the United States district court for any district in which—

(A) the defendant is located, resides, or is doing business, in the case of an action against a person;

(B) the vessel is located, in the case of an action against a vessel; or

(C) the destruction of, loss of, or injury to a sanctuary resource occurred.

(d) Use of Recovered Amounts.—Response costs and damages recovered by the Secretary under this section shall be retained by the Secretary in the manner provided for in section 9607(f)(1) of title 42, and used as follows:

(1) Response costs.—Amounts recovered by the United States for costs of response actions and damage assessments under this section shall be used, as the Secretary considers appropriate—

(A) to reimburse the Secretary or any other Federal or State agency that conducted those activities; and

(B) after reimbursement of such costs, to restore, replace, or acquire the equivalent of any sanctuary resource.

(2) Other amounts.—All other amounts recovered shall be used, in order of priority—

(A) to restore, replace, or acquire the equivalent of the sanctuary resources that were the subject of the action, including for costs of monitoring and the costs of curation and conservation of archeological, historical, and cultural sanctuary resources;

(B) to restore degraded sanctuary resources of the national marine sanctuary that was the subject of the action, giving priority to sanctuary resources and habitats that are comparable to the sanctuary resources that were the subject of the action; and

(C) to restore degraded sanctuary resources of other national marine sanctuaries.

(3) Federal-state coordination.—Amounts recovered under this section with respect to sanctuary resources lying within the jurisdiction of a State shall be used under paragraphs (2)(A) and (B) in accordance with the court decree or settlement agreement and an agreement entered into by the Secretary and the Governor of that State.

(e) Statute of Limitations.—An action for response costs or damages under subsection (c) of this section shall be barred unless the complaint is filed within 3 years after the date on which the Secretary completes a damage assessment and restoration plan for the sanctuary resources to which the action relates.

SEC. 313. [16 U.S.C. 1444] AUTHORIZATION OF APPROPRIATIONS

There are authorized to be appropriated to the Secretary—

(1) to carry out this chapter—

(A) \$32,000,000 for fiscal year 2001;

(B) \$34,000,000 for fiscal year 2002;

(C) \$36,000,000 for fiscal year 2003;

(D) \$38,000,000 for fiscal year 2004;

(E) \$40,000,000 for fiscal year 2005; and

(2) for construction projects at national marine sanctuaries, \$6,000,000 for each of fiscal years 2001, 2002, 2003, 2004, and 2005.

SEC. 314. [16 U.S.C. 1445] U.S.S. MONITOR ARTIFACTS AND MATERIALS

(a) Congressional Policy.—In recognition of the historical significance of the wreck of the United States ship Monitor to coastal North Carolina and to the area off the coast of North Carolina known as the Graveyard of the Atlantic, the Congress directs that a suitable display of artifacts and materials from the United States ship Monitor be maintained permanently at an appropriate site in coastal North Carolina.

(b) Disclaimer.—This section shall not affect the following:

(1) Responsibilities of Secretary.—The responsibilities of the Secretary to provide for the protection, conservation, and display of artifacts and materials from the United States ship Monitor.

(2) Authority of Secretary.—The authority of the Secretary to designate the Mariner's Museum, located at Newport News, Virginia, as the principal museum for coordination of activities referred to in paragraph (1).

SEC. 315. [16 U.S.C. 1445a] ADVISORY COUNCILS

(a) Establishment.—The Secretary may establish one or more advisory councils (in this section referred to as an “Advisory Council”) to advise and make recommendations to the Secretary regarding the designation and management of national marine sanctuaries. The Advisory Councils shall be exempt from the Federal Advisory Committee Act.

(b) Membership.—Members of the Advisory Councils may be appointed from among—

(1) persons employed by Federal or State agencies with expertise in management of natural resources;

- (2) members of relevant Regional Fishery Management Councils established under section 1852 of this title; and
- (3) representatives of local user groups, conservation and other public interest organizations, scientific organizations, educational organizations, or others interested in the protection and multiple use management of sanctuary resources.
- (c) Limits on Membership.—For sanctuaries designated after November 4, 1992, the membership of Advisory Councils shall be limited to no more than 15 members.
- (d) Staffing and Assistance.—The Secretary may make available to an Advisory Council any staff, information, administrative services, or assistance the Secretary determines are reasonably required to enable the Advisory Council to carry out its functions.
- (e) Public Participation and Procedural Matters.—The following guidelines apply with respect to the conduct of business meetings of an Advisory Council:
 - (1) Each meeting shall be open to the public, and interested persons shall be permitted to present oral or written statements on items on the agenda.
 - (2) Emergency meetings may be held at the call of the chairman or presiding officer.
 - (3) Timely notice of each meeting, including the time, place, and agenda of the meeting, shall be published locally and in the Federal Register, except that in the case of a meeting of an Advisory Council established to provide assistance regarding any individual national marine sanctuary the notice is not required to be published in the Federal Register.
 - (4) Minutes of each meeting shall be kept and contain a summary of the attendees and matters discussed.

SEC. 316. [16 U.S.C. 1445b] ENHANCING SUPPORT FOR NATIONAL MARINE SANCTUARIES

- (a) Authority.—The Secretary may establish a program consisting of—
 - (1) the creation, adoption, and publication in the Federal Register by the Secretary of a symbol for the national marine sanctuary program, or for individual national marine sanctuaries or the System;
 - (2) the solicitation of persons to be designated as official sponsors of the national marine sanctuary program or of individual national marine sanctuaries;
 - (3) the designation of persons by the Secretary as official sponsors of the national marine sanctuary program or of individual sanctuaries;
 - (4) the authorization by the Secretary of the manufacture, reproduction, or other use of any symbol published under paragraph (1), including the sale of items bearing such a symbol, by official sponsors of the national marine sanctuary program or of individual national marine sanctuaries;
 - (5) the creation, marketing, and selling of products to promote the national marine sanctuary program, and entering into exclusive or nonexclusive agreements authorizing entities to create, market or sell on the Secretary's behalf;
 - (6) the solicitation and collection by the Secretary of monetary or in-kind contributions from official sponsors for the manufacture, reproduction or use of the symbols published under paragraph (1);
 - (7) the retention of any monetary or in-kind contributions collected under paragraphs (5) and (6) by the Secretary; and
 - (8) the expenditure and use of any monetary and in-kind contributions, without appropriation, by

the Secretary to designate and manage national marine sanctuaries. Monetary and in-kind contributions raised through the sale, marketing, or use of symbols and products related to an individual national marine sanctuary shall be used to support that sanctuary.

(b) Contract Authority.—The Secretary may contract with any person for the creation of symbols or the solicitation of official sponsors under subsection (a) of this section.

(c) Restrictions.—The Secretary may restrict the use of the symbols published under subsection (a) of this section, and the designation of official sponsors of the national marine sanctuary program or of individual national marine sanctuaries to ensure compatibility with the goals of the national marine sanctuary program.

(d) Property of United States.—Any symbol which is adopted by the Secretary and published in the Federal Register under subsection (a) of this section is deemed to be the property of the United States.

(e) Prohibited Activities.—It is unlawful for any person—

(1) designated as an official sponsor to influence or seek to influence any decision by the Secretary or any other Federal official related to the designation or management of a national marine sanctuary, except to the extent that a person who is not so designated may do so;

(2) to represent himself or herself to be an official sponsor absent a designation by the Secretary;

(3) to manufacture, reproduce, or otherwise use any symbol adopted by the Secretary under subsection (a)(1) of this section, including to sell any item bearing such a symbol, unless authorized by the Secretary under subsection (a)(4) of this section or subsection (f) of this section; or

(4) to violate any regulation promulgated by the Secretary under this section.

(f) Collaborations.—The Secretary may authorize the use of a symbol adopted by the Secretary under subsection (a)(1) of this section by any person engaged in a collaborative effort with the Secretary to carry out the purposes and policies of this chapter and to benefit a national marine sanctuary or the System.

(g) Authorization for Non-Profit Partner Organization to Solicit Sponsors.—

(1) In general.—The Secretary may enter into an agreement with a non-profit partner organization authorizing it to assist in the administration of the sponsorship program established under this section. Under an agreement entered into under this paragraph, the Secretary may authorize the non-profit partner organization to solicit persons to be official sponsors of the national marine sanctuary system or of individual national marine sanctuaries, upon such terms as the Secretary deems reasonable and will contribute to the successful administration of the sanctuary system. The Secretary may also authorize the non-profit partner organization to collect the statutory contribution from the sponsor, and, subject to paragraph (2), transfer the contribution to the Secretary.

(2) Reimbursement for administrative costs.—Under the agreement entered into under paragraph (1), the Secretary may authorize the non-profit partner organization to retain not more than 5 percent of the amount of monetary contributions it receives from official sponsors under the agreement to offset the administrative costs of the organization in soliciting sponsors.

(3) Partner organization defined.—In this subsection, the term “partner organization” means an organization that—

(A) draws its membership from individuals, private organizations, corporations, academic institutions, or State and local governments; and

(B) is established to promote the understanding of, education relating to, and the conservation of the resources of a particular sanctuary or 2 or more related sanctuaries.

SEC. 317. [16 U.S.C. 1445nt] SHORT TITLE

This title may be cited as the “The National Marine Sanctuaries Act”.

SEC. 318 [16 U.S.C. 1445c] DR. NANCY FOSTER SCHOLARSHIP PROGRAM

(a) Establishment.—The Secretary shall establish and administer through the National Ocean Service the Dr. Nancy Foster Scholarship Program. Under the program, the Secretary shall award graduate education scholarships in oceanography, marine biology or maritime archeology, to be known as Dr. Nancy Foster Scholarships.

(b) Purposes.—The purposes of the Dr. Nancy Foster Scholarship Program are—

(1) to recognize outstanding scholarship in oceanography, marine biology, or maritime archeology, particularly by women and members of minority groups; and

(2) to encourage independent graduate level research in oceanography, marine biology, or maritime archeology.

(c) Award.—Each Dr. Nancy Foster Scholarship—

(1) shall be used to support graduate studies in oceanography, marine biology, or maritime archeology at a graduate level institution of higher education; and

(2) shall be awarded in accordance with guidelines issued by the Secretary.

(d) Distribution of Funds.—The amount of each Dr. Nancy Foster Scholarship shall be provided directly to a recipient selected by the Secretary upon receipt of certification that the recipient will adhere to a specific and detailed plan of study and research approved by a graduate level institution of higher education.

(e) Funding.—Of the amount available each fiscal year to carry out this chapter, the Secretary shall award 1 percent as Dr. Nancy Foster Scholarships.

(f) Scholarship Repayment Requirement.—The Secretary shall require an individual receiving a scholarship under this section to repay the full amount of the scholarship to the Secretary if the Secretary determines that the individual, in obtaining or using the scholarship, engaged in fraudulent conduct or failed to comply with any term or condition of the scholarship.

Maritime Archeology Defined.—In this section the term “maritime archeology” includes the curation, preservation, and display of maritime artifacts.

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**C BIOLOGICAL AND HISTORICAL/CULTURAL
RESOURCES OF THE STUDY AREA**

APPENDIX C

**BIOLOGICAL AND HISTORICAL/CULTURAL RESOURCES
OF THE STUDY AREA FOR THE
CHANNEL ISLANDS NATIONAL MARINE SANCTUARY
MANAGEMENT PLAN UPDATE**

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1.0 BIOLOGICAL RESOURCES

As a supplement to Section 3, Affected Environment, this appendix provides additional information on the biological resources within the Study Area for this Environmental Impact Statement (EIS), including the Channel Islands National Marine Sanctuary (CINMS) and surrounding area. This includes additional discussion of habitats and species present, including special-status species, such as rare, threatened, or endangered species. Much of this information was taken directly from the 2002 document *Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary - Final Environmental Document* (California Department of Fish and Game 2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html, with the cooperation of the California Department of Fish and Game.

1.1 HABITAT TYPES

Important habitats in the CINMS are classified according to a simple, multidimensional habitat classification, using depth, exposure, substrate type, and dominant plant assemblages (Table C-1). The classification was conducted using existing maps and sediment samples taken throughout the CINMS. These included a Shoreline Inventory Database (Minerals Management Service [MMS] 2000) that describes a variety of coastal features in Santa Barbara County, a series of maps of over 5,000 sediment grabs around the Channel Islands (Amuedo and Ivey, Engineers 1967), a database of soft sediment samples in the northern Channel Islands (U.S. Geological Survey [USGS] unpublished data) and substrate maps of the sea floor around Channel Islands (MMS 1984).

These sources were combined using a geographic information system (GIS) to develop a comprehensive substrate map of the CINMS, divided into soft substrate (e.g., mud, sand, gravel) and hard substrate (e.g., rock, boulder, bedrock). A bathymetric map of the Channel Islands (Waltenberger 1995) was used to distinguish habitat types at the following depth intervals: shoreline, euphotic zone (intertidal–30 meters), upper continental shelf (30–100 meters), lower continental shelf (100–200 meter), continental slope (>200 m). Dominant plant species, including giant kelp and seagrasses, form marine habitats used by diverse groups of invertebrates, fish, mammals and seabirds (Anderson *et al.* 1993). The potential distribution of giant kelp around the northern Channel Islands and Santa Barbara Island was determined from aerial photographs of the region between 1980 and 1989 (Ecoscan 1989). Most of the kelp (approximately 17.2 square nautical miles [nmi²]) is concentrated on the southwestern coasts of San Miguel and Santa Rosa islands.

The habitat types that occur in the Study Area for this EIS, are discussed below.

Table C-1

Habitat Classification and the Approximate Abundance of Each Criterion in Each of the Biogeographical Regions in the CINMS

Ecological Criteria	Units	Oregonian Bioregion	Transition Zone	Californian Bioregion
<i>Coastline characteristics</i>				
1. Sandy beach	mi of coastline	24.8	13.8	4.7
2. Rocky coast (low exposure)	mi of coastline	28.2	11.6	12.5
3. Rocky coast (high exposure)	mi of coastline	27.4	13.6	1.4
<i>Substrate type and depth</i>				
4. Soft sediment (0–30 m)	square NM	38.9	29.6	16.4
5. Hard sediment (0–30 m)	square NM	34.3	7.2	6.6
6. Soft sediment (30–100 m)	square NM	211.6	63.6	56.2
7. Hard sediment (30–100 m)	square NM	23.4	10.1	3.9
8. Soft sediment (100–200 m)	square NM	157	62.9	27.2
9. Hard sediment (100–200 m)	square NM	-	7.3	1.1
10. Soft sediment (>200 m)	square NM	226.7	176.9	160.7
11. Hard sediment (>200 m)	square NM	-	14.6	2.3
<i>Additional features</i>				
12. Emergent rocks (nearshore)	no. <1 NM/ from shore	216	208	95
13. Emergent rocks (offshore)	no. >1 NM/ from shore	12	5	1
14. Submerged rocky features (pinnacles, ridges, seamounts)	square NM	5.9	26.7	4
15. Submarine canyons	square NM	1	33.7	5
<i>Dominant plant communities</i>				
16. Giant kelp	square NM	16.1	5.9	1.8
17. Surfgrass	square NM	13.4	6.7	3.2
18. Eelgrass	square NM	0.3	0.1	0.2

Source: California Department of Fish and Game 2002.

1.1.1 Intertidal Habitat

The intertidal zone is comprised of a variety of coastal habitats that are periodically covered and uncovered by waves and tides. This transition zone between sea and land is the strip of shore ranging from the uppermost surfaces wetted during high tides to the lowermost areas exposed to air during low tides. The vertical extent of tidal change within the Channel Islands can be as high as 3 meters (+2.4 to -0.6 meters) during full or new moon periods. On surf-swept rocky cliffs, the wave splash can extend the marine influence upward another 5 meters or more. Shores with lesser slopes have broader intertidal

surface areas although less splash influence. Low-sloping shores have intertidal regions tens of meters wide.

The intertidal zone is typically divided into four sub-zones defined by tidal exposure (Ricketts and Calvin 1968). The infrequently wetted splash zone includes the area from the highest reach of spray down to the mean high tide line. The high tide zone, exposed more often to air than water, extends from mean high tide level down to the average height of the higher of the two daily low tides. The middle intertidal zone, ranging from mean higher low water to mean lower low water (zero tide level), is typically covered and uncovered twice each day. The low intertidal is normally uncovered only by minus tides. In addition, tidepools, special intertidal features, support pockets of continually submerged life at varying shore levels. Intertidal habitats vary in the type of substrate and degree of exposure to surf. Bottom types in intertidal zones include fine muds, sand, gravel, cobble, boulders, and bedrock. Rock types range from soft sedimentary to hard metamorphic forms. Rocks also vary in the extent of roughness, depressions, cracks, crevices, and vertical relief. Protected embayments and estuaries contain mostly fine particulate substrates while outer coast shores range in composition from sand to various rock types.

The plants and animals inhabiting intertidal shores are subject to periodic immersion in water followed by exposure to air. These intertidal communities must withstand varying degrees of wave shock, dramatic temperature changes, desiccation, and attacks from terrestrial predators. Algae are rare on unconsolidated muddy or sandy shores and much of the invertebrate life, such as worms, crustaceans, snails, and clams dwell under the substrate. Rocky shores support a rich assortment of plants and animals. Numerous green, brown, and red algae are found on rocky shores as well as beds of surfgrass. A wide variety of sedentary invertebrates, including barnacles, limpets, and mussels, compete for space with the plants in the intertidal zone. Mobile invertebrates, such as snails and crabs, often hide in crevices or under rocks, then emerge to graze on plants or prey on other animals. Fishes are limited to tidepools or passing through the intertidal zone at high tide. Seabirds forage in the intertidal zone at low tide. Some seabirds roost in aggregations on cliffs just above the shore. Seals and sea lions haul out on particular intertidal shores, sometimes in dense aggregations.

The Channel Islands experience varying degrees of exposure to winds, waves, currents, and a range of water temperatures. Lacking major rivers and shallow coastal shelves, island shores are predominantly rocky. Of the five islands, Santa Barbara Island has the most bedrock (74 percent), and Santa Rosa the least (62 percent). Santa Barbara Island also has the greatest expanse of boulder beaches (22 percent) while San Miguel Island has almost none (0.2 percent). San Miguel and Santa Rosa Islands have the greatest extent of sandy beaches (36 percent and 33 percent, respectively). Sandy beaches on the Northern Channel Islands occur primarily on the southern shores, except for San Miguel Island, which has sandy beaches on north and south shores.

1.1.2 Subtidal Habitat

Subtidal habitats include those marine habitats ranging from the lower limit of the intertidal zone down to deepwater offshore. To separate nearshore from offshore environments, nearshore subtidal habitats have been defined as depths of 30 meters because these relatively shallow depths are most influenced by coastal oceanographic processes and light levels diminish rapidly in this zone such that few benthic algae exist at greater depths. Nearshore subtidal habitats include mud, sand, gravel, cobble, and bedrock substrates. Rock types range from soft sedimentary to hard metamorphic forms. Protected embayments and estuaries contain mostly fine particulate substrates, while outer coast shores range in composition from sand to various rock types. Though less variable than the intertidal zone, shallow-water habitats are subject to dynamic physical processes, including wave exposures, along-shore currents, upwelling, temperature/salinity/nutrient differentials, and suspended sediment loads.

Typical shallow subtidal areas contain assemblages of plants dominated by giant kelp, invertebrates, and fishes. However, many shallow reefs overgrazed by sea urchins have little macroalgae and greatly reduced species diversity. Deeper current-swept reefs with lower light levels support suspension-feeding invertebrates, including sponges, sea anemones, sea fans, plume worms, bryozoans, and tunicates. Some low-relief rock/cobble/sand habitats in high current areas are dominated by large numbers of filter-feeding brittle stars (*Ophiothrix spiculata*) or sea cucumbers (*Pachythyone rubra*).

1.1.2.1 Nearshore Subtidal - Soft Bottoms

Along unprotected shores, plants cannot anchor on the shifting sands, and surface-dwelling animals are limited to hardy species specially adapted to this rigorous, featureless environment. Such animals include sea pens, sea pansies, sand crabs, moon snails, sand dollars, sand stars, bottom-dwelling sharks and rays, and flatfishes. More animals and some plants occur on protected, stable sand habitats found in the lee of ocean swells or in deeper water less exposed to surge. In contrast to the relatively sparse community living above the sand, a diverse assemblage dwells within the soft sediment. These typically small infaunal (life within the substrate) organisms include worms, crustaceans, snails, and clams. Populations can be quite variable in shallow areas with heavy surge, but they become more stable in calmer and deeper waters.

Many sandy habitats at the islands have relatively steep slopes. The sand on these slopes often is coarse shelly debris because there is little sediment runoff from land and strong water currents sweep away organic material. Stable sand habitats with fine grain sediments generally are limited to sheltered coves at canyon mouths, such as those found around Santa Cruz Island. A few of these locations have well-developed eelgrass meadows. Many other sandy habitats consist of patches of shelly sand between rock reefs, forming mosaics of hard and soft substrata. Rocky habitats at the islands are widespread, especially high-relief volcanic reefs with walls, ledges, caves, and pinnacles. Low-relief sedimentary reefs exist as well, particularly around Santa Rosa Island.

1.1.2.2 Nearshore Subtidal - Hard Bottoms

Rocky subtidal environments are capable of supporting thousands of plant, invertebrate, and fish species, depending on the extent of habitat heterogeneity and influence of physical factors such as water motion, light, temperature, nutrients, and sedimentation. Boring clams and sea urchins create holes and depressions in soft sedimentary reefs that also are utilized by other smaller creatures. These reefs can be broken up or worn down by waves and surge. In addition to hardness, rocks vary in the extent of roughness, cracks, crevices, and vertical relief, all of which provide microhabitats for a host of organisms, including worms, crustaceans, mollusks, brittle stars, and fishes. Water motion can increase ecosystem productivity by supplying planktonic food to filter and suspension feeding invertebrates such as sponges, cnidarians, plume worms, bivalves, and tunicates. In contrast, sedimentation can cover rock surfaces and reduce productivity by preventing settlement of spores and larvae, by clogging filtering apparatuses, and by blocking light required by plants.

Plants need light and nutrients for photosynthesis, and hence are more abundant in shallow water. Numerous green, brown, and red algae occur, as well as surfgrass. Algae may form crusts, turfs, large blades, stalked plants, or tall kelps. Plants provide microhabitats and food for animals, but they also compete for space with sessile invertebrates. As light diminishes in deeper water, plants disappear. Here reefs become increasingly covered with attached invertebrates (e.g., sponges, sea anemones, cup corals, sea fans, plume worms, rock scallops, and tunicates), which in shallow habitats, often are limited to vertical surfaces and under hangs not suitable for plants.

The distribution of shallow subtidal reefs is less well known than the distribution of the rocky intertidal reefs. Large-scale studies have not been done, and the rigorous ocean conditions in many areas make scuba diving surveys difficult. Often nearshore reefs are found where rocky intertidal habitat occurs. Kelp beds generally are good indicators of subtidal reefs (except for beds of the *Macrocystis angustifolia* form that occur on sand). Kelp canopies have been mapped by aerial surveys (Crandel 1915; Ecoscan 1989; Hodder and Mel 1978).

Short-lived, opportunistic species commonly occur on freshly exposed rock surfaces. Deeper nearshore habitats are often dominated by extensive algal cover, including red algae and sea palms. The cold, nutrient-rich waters of the northern islands support well-developed assemblages of suspension-feeding invertebrates (e.g., sponges, anemones, plume worms, bryozoans, and tunicates), as well as algal grazers such as snails, sea urchins, and crabs. Fishes, such as rockfishes, are characteristic of the cold-water Oregonian Province.

1.1.2.3 Offshore Subtidal

Beyond the nearshore subtidal zone are deep-water habitats extending from 30 to >200 meters deep over the continental shelf and slope. East of the continental slope, the Continental Borderland is characterized by ridges, basins, and submarine canyons. The Santa Barbara Basin, which reaches a depth of 590 meters, is prominent in the Santa Barbara Channel. Well over 90 percent of deep-water benthic habitats in the Channels Islands consist of fine sands in shallower portions, grading into silt and clay-dominated sediments in deeper portions (Science Applications International Corporation [SAIC] 1986; Thompson *et al.* 1993). These soft-bottom particulates are derived from terrestrial runoff and decaying plankton. Coarse sediments occur near Point Conception, and north of San Miguel Island (Blake and Lissner 1993). Fine sediments occur on the sill at the western end of the Santa Barbara Channel, and in the Santa Barbara Basin.

Records of the bottom composition for the remaining hard-bottom areas are incomplete and are based on old lead-line soundings, snags reported by fishermen, and geophysical surveys conducted by the USGS and oil companies. Direct observational evidence has revealed that many previously reported hard-bottom areas are not exposed rock but reefs covered by soft sediments (SAIC 1986). Deep rock bottoms often are located offshore from major headlands and islands, and on the highest parts of undersea ridges, banks, and pinnacles. Most of the deep-water hard bottom substrates are low-relief reefs less than 1 meter in height; some reefs have 1- to 5-meter high features. Boulders and bedrock outcrops are the predominant rocky substrates. Higher relief pinnacles and ridges occur in some areas, such as off the northwest end of San Miguel Island.

Light disappears rapidly below 50-meter depths, thus offshore benthic habitats do not support marine algae and plants. The fauna of these habitats have been described from remote grab, dredge, trawl, remote-operated vehicle (ROV), and manned submersible surveys conducted from surface vessels for research, fisheries, and environmental studies, especially those related to municipal outfalls and oil development activities. Major deep-water biological surveys include those conducted for the Bureau of Land Management (BLM) (Fauchald and Jones 1979a,b), the Southern California Coastal Water Research Project (SCCWRP) (e.g., Allen *et al.* 1998), and the MMS (Blake and Lissner 1993; SAIC 1986).

Offshore deep-water communities have few species in common with nearshore communities, due in part to cold temperatures and reduced light. The composition of deep assemblages depends particularly on sediment composition, water depth, vertical relief, and extent of siltation (SAIC 1986; Thompson *et al.* 1993). For a given depth, deep assemblages tend to be more similar over broad geographic ranges than shallow-water communities because the physical environment (e.g., temperature, salinity, darkness) is fairly stable. Most deep muddy-bottom invertebrates are detritus feeders while rocky-substrate

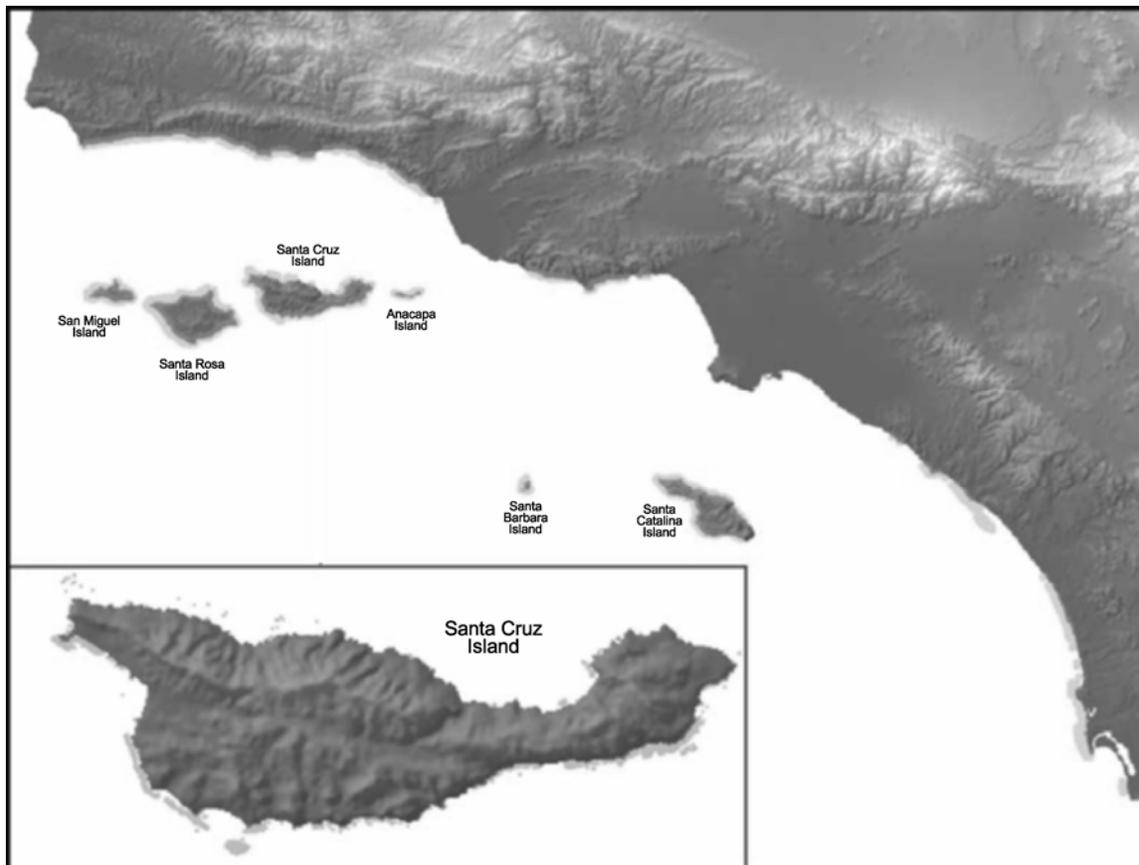
invertebrates are predominantly suspension-feeders. Low-relief deep reefs often are heavily silted, with greatly reduced species diversity. Increasing siltation smothers attached invertebrates, gradually changing the habitat to soft bottom. Scour from deep-water currents also influences the distribution of marine life.

The stability of most deep-water soft-bottom habitats supports greater diversity of infaunal and epifauna (life on or just above the substrate) compared to shallow particulate substrates disturbed by waves and surge. Typical infauna on deep fine-sediment habitats include sea pens (*Stylatula elongata* and *Ptilosarcus gurneyi*), polychaete worms (*Heteromastus* sp., *Prionospio lobulata*, and *Chloeia pinnata*), echiuran worms (*Urechis* sp.), amphipods (*Orchestoidea* spp., *Photis* spp., *Polycheria* sp., *Oligochinus* sp., and *Caprella* spp.), brittle stars (*Amphiodia squamata* and *A. urtica*), and small snails and clams (Family Mollusca). Epifauna include shrimp (*Pandalus* spp.), octopus (*Octopus* spp.), sea cucumbers (*Parastichopus* spp.), seastars (Class Asteroidea), heart urchins (*Lovenia* spp.), and flatfishes (Families Bothidae and Pleuronectidae). Fauchald and Jones (1979a,b, 1983) and Thompson *et al.* (1993) divide the assemblages into four major benthic habitats: (1) mainland shelves (50 to 150 meters) often dominated by brittle stars; (2) offshore shelves, ridges, and banks (50 to 500 meters) with brittle stars, the clam (*Parvilucina tenuisculpta*), the polychaete (*Chloeia pinnata*), and the amphipod (*Photis* spp.); (3) basin slopes (150 to 600 meters) with the polychaete worms most common in the Santa Barbara Channel; and (4) basin floors (deeper than 600 meters) where assemblages are not stable over time because these areas often experience anoxic conditions.

Common invertebrates on deep hard substrates include sponges, anemones, cup corals, sea fans, bryozoans, feather stars, brittle stars, sea stars, and lamp shells. Demersal fishes can be common in these habitats, especially various species of rockfishes. In the northern Santa Barbara Channel, three principal hard bottom assemblages were described for outer shelf-upper slope depths (105-213 meters) in MMS surveys (SAIC 1986): (1) a low-relief assemblage dominated by anemones, brittle stars, and lamp shells; (2) a medium relief assemblage characterized by the anemone *Corynactis californica* and deep-water coral *Lophelia californica*; and (3) a broadly distributed community composed of the anemone *Metridium senile*, cup corals, and the feather star *Florometra serratissima*.

1.1.3 Kelp Forest Habitat

Giant kelp (*Macrocystis pyrifera*) forms extensive underwater beds on rocky substrates (the *M. angustifolia* form on the south coast occurs on sand) at shallow subtidal depths (3 to 45 meters) throughout the project area (Figure C-1). Giant kelp, a keystone species, transforms reefs into lush underwater forests. This highly productive plant provides food, attachment sites, and shelter for a myriad of invertebrates and fishes. The dense thicket of kelp in the water column and at the surface is particularly important as a nursery habitat for juvenile fishes (Carr 1989).



Source: Christensen 2003. Data compiled from 1988, 1999, 2002.

Figure C-1 Giant Kelp Canopies of the CINMS

Giant kelp forests range from San Francisco to central Baja California. Giant kelp is a perennial species that has multiple fronds buoyed up by pneumatocysts arising from a large holdfast. Individual fronds live only about 6 months (during which time they may grow 30 meters or more in length), but new fronds are continually produced during the several year life span of the plant (Rosenthal *et al.* 1974). Giant kelp has a life cycle that alternates between the large sporophyte phase and a microscopic gametophyte generation. The impressive underwater kelp forests with extensive surface canopies are conspicuous and popular features of this region. The complex vertical structure of highly productive kelp ecosystems provides food, attachment sites, and shelter for a diverse assemblage of plants and animals, many of which are targeted for sport and commercial harvest. Kelp itself is harvested commercially for use in a wide variety of food and industrial products.

The particular structure of plant and animal assemblages within kelp forests depends on many factors, including the nature and profile of the substrate, degree of wave exposure, water clarity, and temperature/nutrient conditions (Ebeling *et al.* 1980a; Foster and Schiel 1985; Hodder and Mel 1978; Murray and Bray 1993). Kelp beds typically have several layers of understory algae that increase habitat heterogeneity (Dayton *et al.* 1984; Foster and Schiel 1985). Boa kelp, palm kelps, and bladder weeds can

rise 1 or more meters off the bottom like bushes. Below these are smaller prostrate or low-growing algae less than 1 meter in height. Below these kelps can be a turf layer, and finally a crust layer often dominated by pink coralline algae.

The location and extent of kelp beds in the Southern California Bight (SCB) have been determined at various times through aerial photographic surveys by commercial harvesters, Bureau of Land Management, Department of Fish and Game, and others (Crandall 1915; Hodder and Mel 1978; Kelco unpublished maps; Neushul 1981). Locations supporting kelp generally have been consistent through time, but the extent of these beds has varied considerably. The physical settings for kelp habitats around the Channel Islands are more variable than mainland locations (Hodder and Mel 1978). Extent of wave exposure, substrate types, and slopes vary extensively. Water clarity is greater at the islands, allowing light to penetrate deeper, thus kelp ranges into deeper water compared to the mainland. The greater habitat heterogeneity at the islands has resulted in greater kelp forest species diversity compared to mainland kelp beds (Murray and Bray 1993).

Kelp mortality can occur from various physical and biological conditions. Powerful storm swells can rip out plants that entangle other plants, resulting in considerable losses. These largely seasonal (winter) disturbances are most prevalent in exposed locations. High temperature/low nutrient conditions may cause deterioration of kelp in the warmest summer months and during El Niño periods (Foster and Schiel 1985; Murray and Bray 1993; Tegner and Dayton 1987). Increased turbidity and sedimentation in kelp habitats can reduce productivity and increase mortality, particularly of the microscopic gametophyte and tiny sporophyte stages (Dean and Deysner 1983).

Grazing invertebrates and fishes consume kelp. Sea urchins are especially efficient at munching through kelp holdfasts, causing detached plants to drift away. Normally dwelling in crevices where they feed on drift kelp, urchins may emerge when drift plants are scarce and overgraze entire kelp beds, turning areas into "urchin barrens" (Ebeling *et al.* 1985; Foster and Schiel 1985; Murray and Bray 1993). These overgrazed areas can persist because high densities of urchins are capable of surviving in a near-starvation state while consuming any edible plants that settle from the plankton (Carroll *et al.* 2000). Urchin barrens have become increasingly common during the past two decades at the Channel Islands coincident with the long-term warming period accompanied by numerous El Niño events and unusually powerful storms (Engle unpublished data).

Kelp beds also are foraging habitats for seabirds and marine mammals. Cormorants dive through the forests seeking fish; while gulls, pelicans, and terns hunt surface fishes in or near the canopy. Where sea otters occur, they are closely associated with kelp beds, diving for a variety of invertebrate prey. Sea lions, seals, and occasional whales use kelp beds as foraging areas.

1.1.4 Surfgrass and Eelgrass Habitat

There are two types of marine flowering plants found in the CINMS consisting of four species. Surfgrass (*Phyllospadix spp.*) and eelgrass (*Zostera spp.*) are commonly confused due to their similar appearance. Each forms dense beds on different substrate and in different conditions.

1.1.4.1 Surfgrass (*Phyllospadix spp.*)

Surfgrass attaches by short roots to rock on surf-swept shores from the low intertidal zone to depths of 10 to 15 meters. The emerald green grass commonly occurs in dense perennial beds 0.5 to 2 meters tall formed primarily by vegetative growth from spreading rhizomes. Two species (*Phyllospadix torreyi* and *P. scouleri*) overlap in geographical distribution and morphological characteristics (Dawson and Foster

1982). *Phyllospadix torreyi* generally has longer (1 to 2 meters), narrower (1 to 2 millimeters) leaves, longer flower stems with several spadices (floral spikes), and occurs more in semi-protected habitats as well as in deeper water. *Phyllospadix scouleri* tends to have shorter (less than 50 centimeters), broader (2 to 4 millimeters) leaves, shorter flower stems with 1 to 2 spadices, and is found more often in wave-swept intertidal areas (Figure C-2).

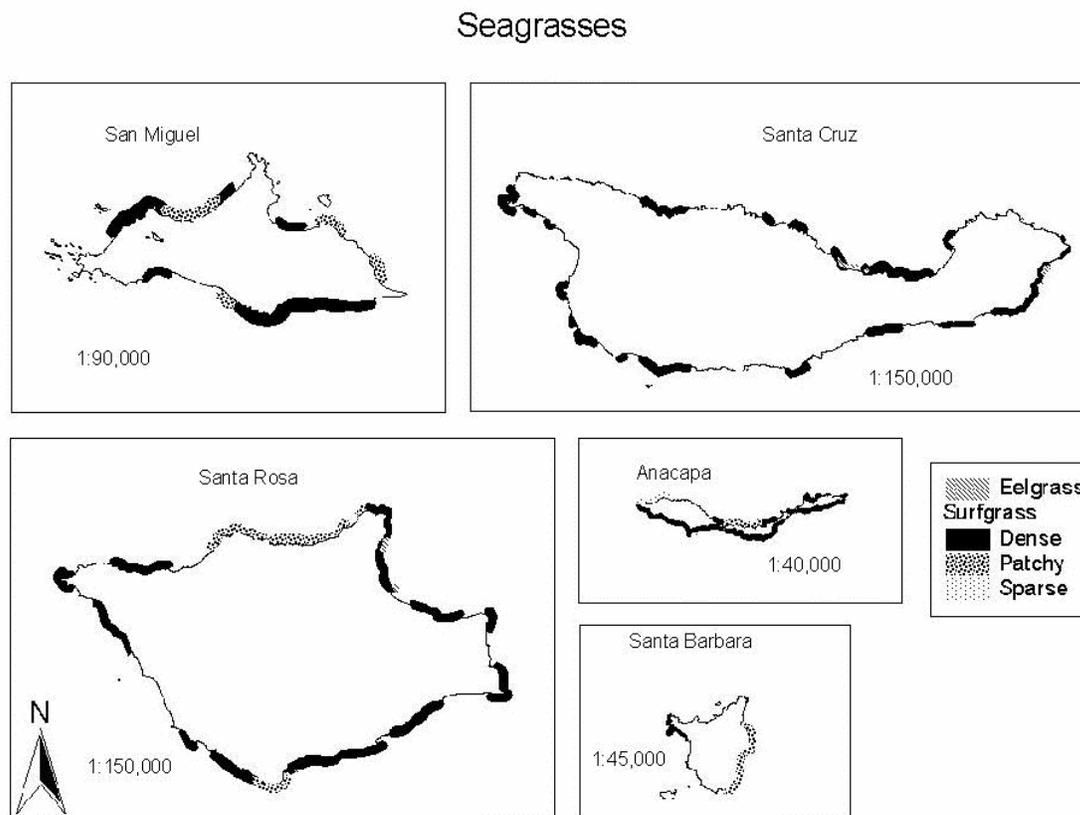


Figure C-2 Distribution of Seagrasses Within the CINMS

Surfgrass beds are highly productive ecosystems, providing structurally complex microhabitats for a rich variety of epiphytes, epibenthos, and infaunal species. Stewart and Myers (1980) identified 71 species of algae and 90 species of invertebrates associated with surfgrass habitats in San Diego. Some organisms, such as the red algae *Smithora naiadum* and *Melobesia mediocris*, are exclusive epiphytes on surfgrass (or eelgrass) (Abbott and Hollenberg 1976). *Phyllospadix* spp. beds provide nursery habitat for various fishes and invertebrates, including the California spiny lobster (*Panulirus interruptus*) (Engle 1979).

Surfgrass beds are persistent (Turner 1985) and can preempt space from other plants, including boa kelp (Black 1974) and sargassum weed (Deysner and Norton 1982). Surfgrass cannot tolerate much heat or drying; the leaves will bleach quickly when midday low tides occur during hot, calm-water periods. Surfgrass can be particularly sensitive to sewage discharge (Littler and Murray 1975) and oil pollution (Foster *et al.* 1988). Recovery can be relatively rapid if the rhizome systems remain functional, but it might take many years if entire beds are lost because recruitment is irregular and must be facilitated by the presence of perennial turf algae to which surf grass seeds attach (Turner 1983, 1985). Eelgrass (*Zostera* spp.)

Eelgrass is the second type of flowering plant that grows within the CINMS. Eelgrass beds are known to be ecologically important for primary production, nutrient cycling, and substrate stabilization (Phillips 1984). They provide habitat and food for a unique assemblage of plants, invertebrates, and fishes (den Hartog 1970; McConnaughey and McRoy 1979; Phillips 1984). Eelgrass grows worldwide in quiet, temperate-water mud or sand habitats, especially in bays and estuaries from the low tide level down to 6 meters. It also occurs on sheltered substrates on the open coast to depths of 18 to 30 meters. The shallow limit for *Zostera* is generally determined by wave action while the deep limit is determined by light limitations (den Hartog 1970; Phillips 1984). Open coast subtidal *Zostera* beds have not been well studied, but extensive literature exists for embayment meadows (den Hartog 1970 and Phillips, 1984 for overviews). Eelgrass produces seeds that may drop nearby or can be carried by floating flower stalks to distant locations. The viability of seeds can be low and successful recruitment to new habitats relatively rare (den Hartog 1970; Phillips 1984). Once established, *Zostera* patches can expand to form vast meadows through vegetative growth along extended rhizomes.

All eelgrass throughout California was considered to be *Z. marina* until Phillips and Echeverria (1990) reported *Z. asiatica* along the mainland coast from Tomales Bay to Santa Monica. Typical characteristics of *Z. marina* include: presence at depths less than 5 meters, leaf width 1 to 12 millimeters, leaf tips obtuse, seeds ridged, March flowering, and seeds present May to June. In contrast, *Z. asiatica* characteristics include: 5- to 17-meter depths, leaf width 12 to 18 millimeters, leaf tips notched, seeds smooth, August flowering, and seeds present September to October. However, characteristics for the two species are variable and intergrade such that species designation is difficult and subject to continuing scientific debate.

At the Channel Islands, a total of 278 species (and higher taxa) were identified from eelgrass beds, not including most infaunal species, species requiring laboratory identification, or minute species (Engle *et al.* unpublished data). The diversity of conspicuous plant, invertebrate, and fish epibiota was nearly twice as high within eelgrass beds (approximately 150 species) as on surrounding sand habitats (approximately 80 species).

Important invertebrates include sea anemones, worms, crabs, snails, clams, and seastars. Some species are obligate dependents on *Zostera*. In the Channel Islands the brown alga *Punctaria occidentalis*, the flatworm, *Phylloplana viridis*, the sea hare, *Phyllaplysia taylori*, and the limpet, *Tectura depicta*, are epiphytes unique on *Zostera*. The red algae, *Smithora naidum* and *Melobesia mediocris*, also occur on eelgrass and surfgrass (*Phyllospadix spp.*). The isopod, *Idotea resicata*, pipefish, *Syngnathus sp.*, and giant kelpfish, *Heterostichus rostratus*, can occur with other plants, but they are closely associated with eelgrass, often appearing grass green in color. *Zostera* meadows are nursery habitats for a variety of fishes, including bottom-dwellers (e.g., flatfishes and gobies) and epibenthic swimmers (e.g., clinids, seaperches, and basses). Eelgrass beds at the Channel Islands are host to schools of juvenile fishes, especially giant kelp fish, surf perches, senoritas, olive rockfish, and kelp bass (Engle *et al.* unpublished data).

Eelgrass habitats are vulnerable to oil spills, but the impacts are not well understood. Unlike slime-producing algae that can slough off oil, eelgrass has non-mucilaginous leaves to which oil quickly adheres (CDFG 2002). Jackson *et al.* (1989) reported substantial oil effects on tropical grass beds of Panama; however, Dean *et al.* (1996) found neither acute nor sub-lethal effects on Alaskan eelgrass. Adverse effects on invertebrate communities associated with eelgrass beds have been documented more clearly: hydrocarbons were most persistent, recovery longer, and injury levels higher in eelgrass habitats of Alaska (Dean *et al.* 1996). Other threats to eelgrass meadows include pollution, habitat disturbances from development (e.g., changes in sediment runoff and water clarity, piers, moorings), cumulative impacts from boat anchors, and overgrazing by sea urchins.

Eelgrass has been found at 10 locations around the Northern Channel Islands at depths of 3 to 15 meters (see Figure C-2), but it is unclear which species is present because their characteristics intergrade (Engle *et al.* in press). The *Zostera* sites occur on both north and south sides of the islands in coves sheltered from west and northwest swells. The largest beds (approximately 3 to 12 hectares) occur at Smugglers Cove, Canada del Agua, and Prisoners Harbor on Santa Cruz Island and at Bechers Bay on Santa Rosa Island. Moderate beds (approximately 0.3 to 0.7 hectare) are found at Scorpion and Forney Coves on Santa Cruz Island and at Johnsons Lee on Santa Rosa Island. A few small patches of eelgrass exist at Cathedral Cove and Cat Rock on Anacapa Island and at Yellowbanks Anchorage on Santa Cruz Island. The single patch at Cathedral Cove is the only known remnant of once widespread beds scattered along the north side of Anacapa Island.

1.1.5 Water Column Habitats

The water column habitat can be subdivided into the neritic/epipelagic, mesopelagic, and bathypelagic zones (Cross and Allen 1993). Light penetration, water temperature, and water mass structure define vertical zonation.

Neritic/epipelagic habitats in the Channel Islands extend to depths of 100 meters. This zone is euphotic generally to 30 meters, and temperatures fluctuate diurnally and seasonally. It is approximately 50 meters deep in turbid nearshore waters and expands offshore in clear oceanic waters (Cross and Allen 1993). The neritic/epipelagic zone is inhabited by fishes that migrate to the surface waters at night (nyctoepipelagic), bottom-associated species that feed in the water column (nektobenthic) (Horn 1980), and the eggs and larvae of most pelagic and demersal fishes (Loeb *et al.* 1983).

The mesopelagic zone is characterized by steep environmental gradients. It extends from the permanent thermocline below the compensation depth to the 6-degree C isotherm at 500 to 600 meters (Cross and Allen 1993). The bathypelagic zone is characterized by uniformity and extends nearly to the bottom. It is absent or restricted in the nearshore basins and expands offshore (Cross and Allen 1993). Fish typical of the mesopelagic and bathypelagic zones include species from the following families: Alepisauridae (lancetfishes), Anoplomatidae (sablefishes), Bathylagidae (deep-sea smelts and owlfishes), Cottidae (sculpins and blob sculpins), Gonostomatidae (bristlemouths), Liparidae (snailfishes), Macrouridae (rattails or grenadiers), Moridae (codlings or morids), Myctophidae (lanternfishes), Nemichthyidae (snipe eels), Ophidiidae (cusk-eels and brotulas), Sternoptychidae (hatchetfishes), Stomiidae (dragonfishes and viperfishes), and Zoarcidae (eelpouts) (Drazen 2003).

1.1.6 Marsh Habitats

1.1.6.1 Freshwater Marsh Habitats

Freshwater marsh habitats occur in areas where water remains at or near the ground surface for the entire year and soils remain saturated. Freshwater marshes occur predominantly in perennial watercourses along the mainland coastline of the Channel Islands region (examples include San Antonio Creek on Vandenberg Air Force Base and the Santa Ynez, Ventura, and Santa Clara rivers) but also in vernal pools, swales and other natural and artificial water impoundments (McGinnis 2000).

The growth of plant species in freshwater marshes is greatest during the summer months. Dominant plant species include: California bullrush, tule, American bullrush, broad-leaved cattail, giant bur-reed, hoary nettle; a number of rushes and sedges.

1.1.6.2 Coastal Brackish and Salt Marsh Habitats

Serving as transition zones between freshwater and marine species, coastal brackish marsh habitats (such as estuaries) are important to many of the species found in the Sanctuary. Salinity in coastal marshes may vary considerably from site to site, but typically increases at high tide or during seasons of low freshwater runoff. This type of habitat usually transitions into coastal salt marsh habitat along the ocean and into freshwater marsh habitat at the mouths of rivers. Important regional coastal brackish marsh habitats include Shuman Canyon and San Antonio Lagoon on VAFB, the Santa Ynez River, Goleta Slough, Carpinteria Marsh, the Santa Clara river, Ormond Beach and Point Mugu Lagoon (McGinnis 2000).

In addition to Shuman Canyon and San Antonio Lagoon, VAFB includes the coastal ecosystems of the Santa Ynez River and the San Antonio Creek Estuary, which are habitat for a number of threatened and endangered species (U.S. Air Force 1997). These sensitive coastal systems contribute to the general health of the regional marine ecosystem by providing nutrients and habitat for birds, fish, pinnipeds and other marine species (U.S. Air Force 1997).

The Carpinteria Salt Marsh is habitat to at least 139 resident and transitory bird species (Ferren et al., 1996). The marsh provides habitat for reproductive populations of invertebrate species found only in estuarine environments, acts as a feeding ground for juveniles of the commercially important California halibut and other fish species. In addition, the Carpinteria Salt Marsh harbors several distinct species of plants, including the federally-listed and endangered salt marsh bird's-beak.

Farther south is Mugu Lagoon, the largest regional estuarine lagoon and one of the most pristine wetlands remaining in southern California (Saiki 1997). Contained entirely within the Naval Air Station at Point Mugu, Mugu Lagoon supports the greatest concentration of water birds between Morro Bay and Anaheim-Bolsa Bay (Coastal Conservancy 1997).¹ As a remote site with restricted public access, Mugu Lagoon is recognized as one of the most important mainland roosting sites for the Anacapa Island breeding colony of California Brown Pelicans. The Lagoon also serves as an important staging area for other birds and seals moving to and from Anacapa Island. (Jaques et al., 1996).

1.1.7 Essential Fish Habitat (EFH)

The Pacific Fishery Management Council (PFMC) manages 93 species of fish under three Fishery Management Plans: 1) Coastal Pelagic Species Fishery Management Plan, 2) Pacific Salmon Fishery Management Plan, and 3) Pacific Groundfish Fishery Management Plan. The Magnuson-Stevens Act defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” National Marine Fisheries Service (NMFS) guidelines state that “adverse effects from fishing may include physical, chemical, or biological alterations of the substrate, and loss of, or injury to, benthic organisms, prey species and their habitat, and other components of the ecosystem.” The EFH has been established for five species of coastal pelagic species: Pacific sardine, Pacific mackerel, northern anchovy, jack mackerel, and market squid.

¹ A comprehensive survey of the biological and ecological importance of Mugu Lagoon is found in Jaques et al. (1996) and Saiki (1997).

The EFH also has been established for 83 species of groundfish. EFH for Pacific Coast groundfish is defined as the aquatic habitat necessary to allow for groundfish production to support long-term sustainable fisheries for groundfish and for groundfish contributions to a healthy ecosystem. Descriptions of groundfish fishery EFH for each of the 83 species and their life stages result in over 400 EFH identifications. When these EFHs are taken together, the groundfish fishery EFH includes all waters from the mean higher high water line and the upriver extent of saltwater intrusion in river mouths, along the coast of Washington, Oregon, and California seaward to the boundary of the EEZ. The seven “composite” EFH identifications are as follows: estuarine, rocky shelf, non-rocky shelf, canyon, continental slope/basin, neritic zone (33 feet and shallower), and the oceanic zone (66 feet and deeper).

1.2 SPECIES

1.2.1 Plankton

1.2.1.1 Phytoplankton

Phytoplankton are single cell or colonial algal species that range in size over three orders of magnitude (Siebruth 1979). Phytoplankton can be classified according to size: very small species (autotrophic bacteria) are classified as picoplankton (0.2 to 2 micrometers), most are classified as nanoplankton (2 to 20 micrometers) or microplankton (20 to 200 micrometers), and a few large species as mesoplankton (0.2 to 20 millimeters) (Hardy 1993).

Phytoplankton form the base of the food web; they support grazing zooplankton, fish, and, through their decay, large quantities of marine bacteria. The success of zooplankton depends upon both the quantity and quality of their phytoplankton food supply (Dailey *et al.* 1993). For example, the fecundity (egg production) of zooplankton depends upon the nutritive value (e.g., nitrogen content) of the phytoplankton on which they feed (Checkley 1980a, b). Fish production, in turn, is highly dependent on the growth and productivity of phytoplankton and zooplankton (Ryther 1969). The success of larval fish and their subsequent recruitment into the adult fish population often depend upon spatial and temporal concurrence of fish larvae with an abundance of their plankton food source (Mullin *et al.* 1985).

Many species of phytoplankton inhabit the CINMS. Their relative abundance in terms of numbers, biomass, and production varies greatly both spatially and temporally. The two most abundant and important components of the phytoplankton community are generally the diatoms (bacillariophytes) and the dinoflagellates (pyrrophytes).

The community of larger (greater than 50 millimeters) phytoplankton in the CINMS includes a broad range of temperate water forms as well as forms that characteristically occur in either warmer or colder water. This diversity reflects the general transitional nature of the Channel Island’s flora, which results from the physical oceanographic and mixing characteristics of the region. For example, incursions of exceptionally warm water currents in the area generally carry with them warm water species.

Seasonal and geographic variations in nanoplankton are remarkably stable, and variations in plankton productivity are due primarily to the larger microplankton (see Section 3.2.1). The coastal zone color scanner (CZCS) on the Nimbus 7 satellite has provided useful information on the distribution of phytoplankton by measuring chlorophyll over extensive areas of the SCB. Such data provide synoptic views of complex oceanographic regions, which are impractical to obtain from ships alone. Satellite imagery has also allowed the identification of persistent and striking biological features. Many of these recurring large-scale patterns were either unknown or only dimly perceived prior to the advent of satellite imagery. For example, Nimbus 7 CZCS imagery revealed the occurrence far offshore of a large region of high phytoplankton pigment, a biological “hot spot” that loosely overlies a system of submarine ridges,

banks, and basins of the Continental Borderland. Shallow basins and enclosed shallow areas, such as the Santa Barbara Channel, consistently show high pigment content, with an approximately threefold change in phytoplankton pigment content over a distance of a few kilometers. These large-scale structures undergo significant monthly, seasonal, and annual changes although the large-scale pigment patterns for a given season tend to reappear from one year to another (Pelaez and McGowan 1986).

Numerous measurements of primary production (the photosynthetic conversion of inorganic carbon to organic cellular material by phytoplankton), have been conducted in the SCB. The efficiency of conversion of solar energy into organic matter in the SCB has been estimated to be well under 1 percent (Eppley and Holm-Hansen 1986).

Environmental factors regulating growth lead to a complex spatial and temporal pattern of phytoplankton and productivity in the region. Every point in the water column is basically unique with regard to variables such as light intensity, nutrient mixture and concentration, and temperature. Small-scale biomass patchiness occurs even on scales of less than 1 meter (Hardy 1993). Physical factors of mixing and currents also determine the distribution of phytoplankton. Each species differs in its unique physiological requirements and optima for both light and nutrients. Topographic features of the SCB such as the complex of offshore islands and banks, which run from Santa Rosa and San Nicolas south to Tanner and Cortes banks, impose additional heterogeneity (Hardy 1993).

As is typical of the California coast, plankton abundance and primary production in the SCB are generally higher nearshore than offshore. Since the continental shelf is only a few kilometers wide, internal waves from deep water typically move shoreward, injecting nutrient-rich water onto the shelf area. Episodic sediment disturbance and suspension are important mechanisms of nutrient regeneration in the shallow nearshore area (Fanning *et al.* 1982). Significant differences in longshore abundances of phytoplankton species occurred between the north and south parts of the SCB. Out of 45 cases tested, 19 had greater abundances in the south (Cullen *et al.* 1982). Only three species had greater abundances to the north. In addition to horizontal patterns, the abundance of individual species, total biomass, and productivity of phytoplankton generally show marked differences vertically through the water column (Hardy 1993).

Temporal patterns can be divided into short-term "events" on a scale of hours, days, or a few months and longer term seasonal or recurring annual trends. Like other areas, the Channel Islands can experience blooms (dense growths and accumulations of phytoplankton). Short-term blooms of diatoms and other phytoplankton associated with upwelling events often occur in winter or spring and last for a few days to a few weeks. A typical year has three such blooms each lasting 5 to 6 weeks (Tont 1976). The variance in abundance of phytoplankton between bloom and non-bloom periods can be almost as great as the annual variation in abundance (Tont and Platt 1979).

In general, diatoms have several major peaks of abundance that are 5 to 6 weeks in duration, usually during the first half (but occasionally the latter half) of each summer (Tont 1976, 1981; Tont and Platt 1979). A high correlation in the occurrence of blooms was generally observed between San Diego and Port Hueneme, although the dominant species in the two locales were frequently different. The majority of these blooms occurred in conjunction with upwelling events. Sea surface temperature decreases of 2.5 degrees C indicating upwelling often were associated with diatom standing stock increases of four orders of magnitude (Hardy 1993).

The biomass of the larger diatoms tends to be maximum in late winter or spring although fall blooms also occur (Allen 1936). Large dinoflagellates tend to bloom in summer and slightly earlier at La Jolla than at Port Hueneme, but winter blooms are also known (Allen 1941). Unlike at La Jolla, phytoplankton

densities at Port Hueneme show seasonal variations that exceed the variability on shorter time scales (Tont and Platt 1979).

Under certain oceanographic conditions, blooms are dense enough to alter the color of the water to red, yellow, green, or brown (Oguri *et al.* 1975). Although these blooms can be caused by different groups of organisms, including diatoms, they are most commonly caused by dinoflagellates (Hardy 1993). Although not related to the tidal cycle, blooms of red-pigmented dinoflagellates are called “red tide”. Red tides can occur in the Sanctuary almost any month of the year and are generally most pronounced nearshore (Oguri *et al.* 1975). Spring red tide blooms are dominated by *Prorocentrum micans* while the more intensive and frequent blooms during July through October are dominated by *Gonyaulax polyhedra* (Sweeney 1975).

Many phytoplankton can generate toxins, including *Pseudonitzschia australis*, a phytoplankton species found in the Santa Barbara channel. This diatom produces a neurotoxin called domoic acid. Elevated domoic acid levels in plankton have been linked to deaths of dolphins, sea lions, seabirds, and other marine mammals. By May of 2002, elevated domoic acid levels had led to 70 dolphin beachings and caused 200 sea lions and 200 seabirds to become sick or die (ProMed-mail 2003). During May of 2002, domoic acid was measured at up to 380 parts per million in mussels taken from Santa Barbara waters (ProMed-mail 2003). The federal alert level is 20 parts per million (ProMed-mail 2003). Research on plankton is currently investigating what triggers the algae growth and why different levels of toxins are produced at different times (ProMed-mail 2003).

1.2.1.2 Zooplankton

Zooplankton of the region comprise a large and diverse group of animals. This section will address the interrelationships between the distribution and abundance of these organisms and the oceanography that influences these distributions.

Roseler and Chelton (1987) summarized CalCOFI zooplankton data (displacement volumes) over a 32-year period from 1951 to 1982. They noted that non-seasonal zooplankton variability was dominated by very low-frequency patterns with periods of 3 to 5 years associated with variations in large-scale equatorward transport of the California Current. Years when California Current flow was higher than normal were associated with larger zooplankton biomass of 3 to 4 months' duration.

McGowan *et al.* (1998) note that zooplankton biomass has declined over 70 percent in the central north Pacific ocean since the late 1970s in concert with increasing sea surface temperature. This interannual variable should be considered the baseline for understanding higher frequency events and processes, including biological interactions. These smaller scale, higher frequency processes include seasonal changes and localized events such as coastal upwelling, eddies, plumes, tidal oscillations, bottom processes, diel cycles, wind stress, and turbulence. The extent to which these physical events control or modify zooplankton ecology is a function of the particular organism, including its size, swimming ability, reproductive state, food needs, and other requirements (Dailey *et al.* 1993).

The three zones developed to describe zooplankton are harbor and bay, nearshore (shelf and shelf break), and offshore (open ocean and basins). The spatial distribution of the dominant zooplankton reflects the environmental characteristics of the zone's waters (Dailey *et al.* 1993).

The nearshore zone, which encompasses waters shoreward of the continental shelf slope break or approximately the 200-meter depth contour, is a useful demarcation for study of zooplankton since the water over the continental shelf tends to be an area of high productivity. This augmented region of productivity (Ryther 1969) is usually associated with increased vertical mixing and, thus, greater nutrient

recycling and upwelling, both of which are wind-forced phenomena. The maintenance of a shelf zooplankton assemblage is largely dependent on the physical width of the shelf as well as on the frequency of offshore advection over the shelf.

Microzooplankton feed on particulate organic sources; they comprise protozoan as well as juvenile stages of larger zooplankton. Protozoans account for the greatest percentage of the microzooplankton numerically while the micrometazoans dominate the biomass (Beers and Stewart 1967, 1969a, b, 1970). Because of their high reproductive capacities relative to the metazoans, protozoans have a markedly more important effect on the dynamics of the pelagic trophic web. Since protozooplankton can reproduce by simple asexual binary fission, they are able to respond rapidly to a changing environment. In addition, because generally higher physiological rates are found among small organisms, they are considered by Beers (1986) to be among the most important pelagic herbivores, a role generally reserved for copepods in the past. Beers and Stewart (1969b, 1970) have shown that the biomass of the microzooplankton is generally 20 to 25 percent of the total larger macrozooplankton, both inshore and offshore in the SCB.

The macrozooplankton are a diverse group of animals composed of a number of major taxonomic categories. The medusae, ctenophores, and planktonic molluscs and tunicates are sometimes grouped into what is commonly termed gelatinous zooplankton. The chaetognaths (arrow worms) are important carnivorous zooplankters, but the majority of the zooplankton are made up of crustaceans, mostly copepods. Planktonic copepods are primarily calanoids. Of the calanoid copepods, *Acartia*, *Paracalanmus*, *Labidocera*, and *Calanus* are the most common genera collected nearshore in the SCB (Barnett and Jahn 1987).

Regarding offshore zooplankton, a number of investigators (Eppley *et al.* 1979) have maintained that for eastern boundary currents, including the California Current, wind-drive coastal upwelling is the main source of new nutrients entering the euphotic zone. Others (Reid 1962; Bernal and McGowan 1981; Roesler and Chelton 1987) have found a correlation between zooplankton biomass, cold water temperature, and increased flow of the California Current. Chelton *et al.* (1982) analyzed 30 years of CalCOFI data to identify factors that play dominant roles in California Current zooplankton biomass fluctuations. They compared the longshore component of wind stress with mean monthly zooplankton volumes and concluded that, while wind-induced upwelling may play some role in zooplankton fluctuations, instead fluctuations are more related to changes in the transport of the California Current in the SCB.

Beers and Stewart (1969b) found a gradient of decreasing microzooplankton from onshore to offshore in the SCB. They also found an increasing concentration of microzooplankton relative to the concentration of chlorophyll-a with distance offshore, and suggested that the microzooplankton may play a more significant role in the offshore than in the nearshore realm.

Macrozooplankton of the offshore zone often are many of the same species as those found nearshore. In addition, more oceanic and deeper water species have been collected. Of the calanoid copepods, *Calanus*, *Pleuromanmma*, and *Metridia* are common offshore genera in the SCB (Dailey *et al.* 1993).

Although the SCB contains some unique species, it is largely a transition zone between subarctic, central, and equatorial species. Thus, biomass fluctuations may also be accompanied by changes in species composition. The boundary (or clinal region) between cold, nutrient-rich California Current water (and its associated subarctic species) can vary in position relative to warmer, nutrient-poor water from the south (equatorial water) and west (central water) (Dailey *et al.* 1993).

1.2.2 Macroalgae and Vascular Plants

The northern Channel Islands include a wide variety of marine plants due to its transitional location between cold- and warm-water biogeographic provinces and its diversity of coastal environments, ranging from sheltered embayments to exposed open coast mainland and island habitats (Abbott and Hollenberg 1976; Murray *et al.* 1980). Most marine macrophytes require hard substrate for attachment, and all need light for photosynthesis, thereby largely restricting their depth distribution to the upper 50 meters or less depending on water clarity. In the SCB, 492 species of algae and 4 species of seagrasses are known to occur out of the 673 species described for California in Abbott and Hollenberg (1976) (Murray and Bray 1993). Of the 492 species, 59 are green algae (Chlorophyta), 86 are brown algae (Phaeophyta), and 347 are red algae (Rhodophyta).

Knowledge of the distribution and abundance of marine plants in the SCB has expanded considerably since the mid-seventies, largely due to the quantitative intertidal surveys conducted by the BLM from 1975 to 1979 (Littler 1980; Littler *et al.* 1991). The results of these and other studies are summarized in Murray and Bray (1993). During the 1980s and 1990s, surveys by Channel Islands National Park, MMS, Tatman Foundation, and others focused on monitoring population dynamics of key species at representative regional sites (Dunaway *et al.* 1997). The University of California Santa Barbara (UCSB) has research projects targeting surfgrass (*Phyllospadix*) (Reed *et al.* unpublished data) and boa kelp (*Egregia*) (Blanchette *et al.* unpublished data). Most research on subtidal plants has concentrated on giant kelp forest communities (Foster and Schiel 1985). Much less is known about other subtidal macrophyte assemblages, despite the importance of plant-dominated habitats for a multitude of invertebrates and fishes. Reconnaissance and monitoring surveys focused on the islands have been carried out by CINP-KFMP (CINP 1982 to 1997) and the Tatman Foundation Channel Islands Research Program (CIRP 1980 to 1998). Subtidal eelgrass (*Zostera*) habitats at the islands were investigated recently for the California Coastal Commission (Engle *et al.* unpublished data).

Northern species are defined here as ranging northward from northern Baja California (at about Bahia del Rosario) into and often beyond the Oregonian Province. Southern species, on the other hand, range southward from central California (in the Monterey area) into and, less commonly, through the Californian Province. Transitional species are narrowly defined as endemics restricted to the region of overlap, i.e., between northern Baja California and central California. Species classified as widespread range broadly along the coast between central Baja and northern California.

Species distributions from BLM surveys (Murray and Bray 1993) and more recent surveys support that the northern Channel Islands encompass the transition between southern, warm-water Californian flora and northern, cold-water Oregonian flora. The Channel Islands are particularly transitional, with each island having its own mix of southern versus northern species. Santa Barbara Island is most favored by southern species, Anacapa and Santa Cruz Islands are intermediate with both southern and northern components, while Santa Rosa and San Miguel Islands are populated with a greater portion of northern species. Intertidal algae surveyed along the mainland from Point Conception south to San Diego also show a north-south species gradient for the BLM program (Murray and Littler 1981). Three groupings were evident: (1) sites nearest Point Conception, (2) sites between the Santa Barbara Channel and Santa Monica Bay, and (3) sites between Los Angeles and San Diego.

No marine plants in the region are listed or proposed for listing under State or Federal programs for protecting species in danger of extinction. However, some species deserve special consideration because of their importance as keystone species, dominating ecosystems that are defined by their presence. Giant kelp, surfgrass, and eelgrass are described above.

Analyses of past studies indicate that marine plant diversity is greater in the SCB and the Channel Islands than the diversity associated with central California due to the greater variety of habitats present and to mixing of southern and northern species in the SCB. Murray *et al.* (1980) found that floral diversity in California was positively correlated with decreasing latitude; maximum richness (446 species) occurred between 33 degrees and 34 degrees north latitude.

1.2.2.1 Macroalgae

Algae include the macroscopic members of the plant divisions Chlorophyta (green algae), Phaeophyta (brown algae), and Rhodophyta (red algae), often referred to as seaweeds. The Channel Islands include a rich array of flora of benthic macroalgae and seagrasses. In shallow coastal habitats there is considerable variation in wave action, ocean water masses, thermal regimes, and substrata. The large coastal area and the degree of habitat heterogeneity contribute to the great diversity of macrophytes documented for the SCB (Abbott and Hollenberg 1976; Murray *et al.* 1980).

A total of 492 species of algae occur in the SCB, including 59 species of Chlorophyta, 86 species of Phaeophyta, and 347 species of Rhodophyta, making the composition of the SCB seaweed flora 70.5 percent red, 17.5 percent brown, and 12 percent green (Murray and Bray 1993).

South of Point Conception, the flora tends to be dominated by shorter, more densely branched species of red algae instead of larger, fleshy forms (Abbott and Hollenberg 1976). Brown algae, especially those in the Order Dictyotales, also are more prominent in southern California subtidal habitats, replacing many of the bladed red algae common to the north.

Murray *et al.* (1980) suggested that the high diversity of SCB seaweed flora may be related to the greater amount of shoreline habitat found south of Point Conception and to the various exposures of island habitats to the warm and cold ocean currents prevalent in the SCB.

1.2.2.2 Giant Kelp (*Macrocystis pyrifera*)

See Section 1.1.3 on kelp forest habitat above.

1.2.2.3 Seagrasses

See Section 1.1.4 on surfgrass and eelgrass habitat above.

1.2.3 Invertebrates

Benthic invertebrates include species from nearly all phyla of invertebrates that live in (infauna) or on (epifauna) the sea floor during most of their lives. They may also be characterized as sessile (attached or sedentary) or motile (free-moving). Benthic invertebrates range in size from little known microscopic forms (microinvertebrates) to the more common larger organisms (macroinvertebrates). Most benthic invertebrates also have pelagic larvae. The Channel Islands are characterized by a wide variety of benthic invertebrates due to its transitional location between biogeographic provinces and its diversity of substrates. These include sheltered and exposed coasts at depths from the intertidal to deep slopes, canyons and basins (Thompson *et al.* 1993). The total number of species of benthic invertebrates may well be in excess of 5,000, not including microinvertebrates (Smith and Carlton 1975; Straughan and Klink 1980).

Macroinvertebrates have been studied to varying degrees in representative habitats throughout the region. Ecological relationships are best known for invertebrates from intertidal and shallow subtidal environments because of their accessibility. However, there has been relatively little emphasis in the past two decades on species inventories or compiling species information from various individual nearshore projects. More emphasis has been placed on monitoring population dynamics of key rocky intertidal and kelp forest species by government agencies such as CINP, MMS, CCC, and Santa Barbara County (Dunaway *et al.* 1997; Engle 1994; Engle *et al.* 1997).

A major source for regional species distributional data is the BLM baseline survey program conducted in 1975 to 1979, which included intertidal and deep-water (but not shallow-water) habitats. Straughan and Klink (1980) compiled a taxonomic listing of the common nearshore species from southern California as part of the BLM program, including approximately 300 cnidarians, 60 nemerteans, 575 polychaetes, 1,100 mollusks, 20 pycnogonids, 250 crustaceans, 5 stomatopods, 20 tanaids, 30 cumaceans, 125 isopods, 300 amphipods, 20 sipunculids, 10 echiurans, 150 echinoderms, and 50 ascidians. Other major sources for deepwater invertebrate species inventories include surveys for coastal waste treatment and other outfall monitoring programs and studies sponsored by MMS to evaluate possible impacts of offshore oil and gas operations. The Southern California Association of Marine Invertebrate Taxonomists (SCAMIT) compiled an extensive, standardized list of macro- and mega-invertebrates from SCB mainland soft-bottom habitats at depths from 10 to 300 meters (SCAMIT 1998). Although most of the species records were from outfall studies, other randomly sampled sites were included as part of the SCB Pilot Project (SCBPP) (Allen *et al.* 1998; Bergen *et al.* 1998). These largely unpublished data were compiled primarily from reconnaissance surveys at the Channel Islands during the 1980s and 1990s conducted by the Tatman Foundation CIRP. Other data were included from CINP, CCC, and MMS surveys. Records from the 1975 to 1978 BLM program were not included.

Species distributions from BLM surveys (Seapy and Littler 1980, 1993; Thompson *et al.* 1993) and more recent surveys confirm that the Channel Islands encompass the transition between southern and northern fauna. The Channel Islands are particularly transitional, with each island having its own mix of southern versus northern species. Although conditions are dynamic, the general pattern is that Santa Barbara Island is mostly composed of southern species, Anacapa and Santa Cruz Islands have both southern and northern components, while Santa Rosa and San Miguel Islands have northern species.

The white abalone, which was recently Federally listed as endangered, is the only invertebrate species currently listed under either State or Federal Endangered Species acts. Black abalone was recently listed as a candidate species for Federal listing. A number of invertebrate species deserve special consideration because of their importance as keystone dominants, harvested species, or species particularly sensitive to environmental impacts. These species are highlighted below.

1.2.3.1 Corals

California hydrocoral (*Stylaster californicus* [= *Allopora californica*]). Spectacular, but little known California hydrocoral colonies inhabit subtidal depths (known to 96 meters) from Vancouver Island (Canada) to central Baja California. Hydrocoral colonies occur on current-swept rocky reefs and pinnacles (Engle and Coyer 1981; Osterello 1973). These purple or pink-red hydrocorals resemble small branching tropical staghorn coral (to 53 centimeters). Sessile, filter-feeding adults produce planktonic larvae with limited dispersal. Slow-growing (approximately 0.8 centimeters per year) colonies may live well over 30 years. At least four obligate commensals are supported by the hydrocoral colonies: two polychaetes, one snail, and one barnacle (Osterello 1973; Wright and Woodwick 1997).

Since California hydrocoral keeps its color when dried, it has been commercially harvested in the past for sale in shell shops. The fishery is presently closed. The slow growth and limited dispersal of the

California hydrocoral suggests that it may be particularly sensitive to disturbance and fishery pressure. Colony branches are easily broken by anchors, trawlers, and divers. California hydrocoral has no known predators (Osterello 1973). However, colonies are susceptible to overgrowth by algae or smothering by sediments (Morris *et al.* 1980; Osterello 1973; Thompson *et al.* 1993). California hydrocoral is rare, at least within scuba diving depths, and is especially rare in the Sanctuary. Here it is known from only a few deep, current-swept reefs at Santa Barbara, Santa Cruz, and San Miguel Islands (Engle unpublished data). Its abundance in deepwater is largely unknown although BLM surveys assessed abundances at Tanner and Cortes Banks, south of San Nicolas Island.

1.2.3.2 Ridgeback Prawn (*Sicyonia ingentis*)

Ridgeback prawns occur in subtidal depths (48 to 175 meters) from Monterey Bay to central Mexico. Preferred habitats are deep sand, shell, and mud substrates (Leet *et al.* 1992). These prawns are identified by a prominent ridge along the dorsal midline of the abdomen and a short rostrum. Adult prawns are relatively sedentary. The diet is not well known, though it is suspected to be a detritus feeder as are related prawns. This species may live about 5 years. A commercial fishery using trawling gear began in 1966. Landings decreased dramatically from 1985 to 1991 (population decline confirmed by Department surveys at that time), but have since increased to over 1.4 million pounds in 1999 (Leet *et al.* 1992, 2001; Thompson *et al.* 1993). Surveys by the Department confirmed population declines since 1985.

1.2.3.3 Spot Prawn (*Pandalus platyceros*)

Spot prawns occur in deep water (50- to 533-meters depth) from Alaska to San Diego. These prawns are reddish-brown with two prominent posterior white spots and 3 to 4 longitudinal white stripes on their carapace. They may be associated with hard or soft substrates. The diet of spot prawns consists of small crustaceans, plankton, mollusks, polychaetes, sponges, and carcasses (O'Clair and O'Clair 1998). This species may live for more than 6 years. A commercial fishery using trawling gear and traps began in the Channel Islands area in 1974 (Leet *et al.* 1992). State-wide landings increased steadily from 1984 to nearly 800,000 pounds in 1998 with a drop to 600,000 pounds in 1999 (Leet *et al.* 2001).

1.2.3.4 Spiny Lobster (*Panulirus interruptus*)

California spiny lobster inhabit low intertidal levels to subtidal depths (to 80 meters) from Monterey Bay to central Mexico, but they are rare north of Point Conception. These warm-water crustaceans are identified by their long antennae, reddish-brown color, and large size (to 60 centimeters). Juveniles (under 2 years) utilize shallow vegetated reefs, especially surfgrass beds as nursery habitats (Engle 1979). Adults inhabit crevices in rocky areas, from which they emerge at night to forage on a wide variety of invertebrates, including worms, mollusks, and sea urchins. Spiny lobsters may live 30 years or more (Leet *et al.* 1992). Spiny lobsters occur at all of the Channel Islands, but are more abundant in those locations in the Californian and Transition Zones.

Spiny lobsters have been commercially harvested using traps in California for over 100 years. Most of the fishery is in water less than 30 meters deep although the fishery has expanded to include deeper habitats. A sport fishery (hand capture) is popular among scuba divers in the Channel Islands area. Other sources of mortality include predation by octopus and fishes. California spiny lobster populations have not been well studied; however, population levels appear to have been maintained by recruitment from Baja California facilitated by warm-water patterns over the past two decades (Engle 1994). Landings declined from 1950 to 1975, then increased coincident with establishment of escape ports for sublegal lobsters in traps and development of the long-term warming trend (Leet *et al.* 1992). During the 1990's landings generally ranged from 600,000 to 800,000 pounds with a peak of 950,000 pounds in 1998, then

fell about 500,000 pounds in 1999. Landings in this fishery are strongly influenced by weather, oceanographic conditions and the export market (Leet *et al.* 2001).

1.2.3.5 Crabs

Crabs are primarily benthic arthropods of the Class Brachyura. There are many species, with varying ecological niches. Three major groups of crabs occur in the region, each with multiple species: spider, Cancroid, and Grapsoid crabs. Three species of Cancroid crabs are of particular interest due to their commercial harvest.

Rock crabs: Brown rock crab (*Cancer antennarius*), yellow rock crab (*C. anthonyi*), and red rock crab (*C. productus*).

Rock crab species inhabit low intertidal levels to subtidal depths (less than 40 meters). The brown rock crab occurs from Washington to central Baja California. The yellow rock crab occurs from northern California to southern Baja California. The red rock crab occurs from Alaska to central Baja California. Yellow rock crabs prefer soft substrate habitats while brown and red rock crabs prefer rocky substrata. Rock crabs have smooth carapaces, dorsal shell colorations matching their name, and a yellow underside. Migration is unknown, though they range randomly over several kilometers. Rock crabs are predators (feeding on a wide variety of invertebrates) and scavengers. They may live about 6 years or more (Leet *et al.* 1992).

Large-scale commercial harvest of rock crabs using traps began in 1950. Santa Barbara and the Channel Islands represent major fishery areas. A minor sport fishery, using hoop nets and star traps, exists. Rock crab landings steadily increased through 1984 to over 2 million pounds and have since declined to 700,000 pounds in 1999 with some fluctuation (Leet *et al.* 2001). Other sources of mortality include predation by fishes, octopus, sea stars, and sea otters. Rock crab populations in the region have not specifically been assessed. However, experimental trapping has shown that catches are lower in commercially targeted areas (Gotshall and Laurent 1979; Leet *et al.* 1992; Morris *et al.* 1980).

1.2.3.6 Abalone

Seven species and one sub-species of abalone are found in the Channel Islands. All species are mollusks of the Family Haliotidae, genus *Haliotis*, which adhere with an enlarged foot to rocky substrata, and feed primarily on drift algae. Five species of abalone (black, green, pink, red, and white) were popular sport and commercial species until populations experienced severe declines during the 1980s and 1990s. These declines likely resulted from a combination of overharvest, disease (except for white abalone), and a long-term warming trend leading to poor recruitment coincident with enhanced storm activity, reduced kelp abundance, and increased competition with sea urchins (Leet *et al.* 1992; Engle 1994). The take of abalone has been prohibited in California since 1996, except for sport take by free divers in northern California. Mariculture operations supply small red abalone for restaurants. One species, white abalone, has been listed as endangered and black abalone is a candidate species for such listing under the Federal ESA. The five major species of abalone in the Channel Islands typically occupy different, but overlapping, depth ranges (Haaker *et al.* 1986). From intertidal to deepwater, dominant species are black, green, pink, red, and white abalone.

Black Abalone (Haliotis cracherodii)

Black abalone inhabit mid-low intertidal levels down to shallow subtidal depths (to 6 meters) from Oregon to southern Baja California (Morris *et al.* 1980). They are readily identified by dark, bluish-black coloration, a smooth shell with 5 to 7 open respiratory holes, and relatively small size (5 to 20 centimeters

as adults). Black abalone are relatively sedentary and typically found clustered in wet crevices, under boulders, or on the walls of surge channels along exposed shores. Juveniles graze on diatom films and coralline algae while adults primarily eat drift algae, especially brown kelps. Black abalone compete with sea urchins and other crevice-dwellers for space and food (Miller and Lawrenz-Miller 1993; Taylor and Littler 1979). Where abundant, abalone may be stacked on top of each other, reaching densities of more than 100 per square meter (Douros 1987; Richards and Davis 1993). Black abalone are slow-growing and long-lived, with recruitment apparently being low and variable (Morris *et al.* 1980; VanBlaricom 1993). Growth rates depend on animal size, location, food availability, reproductive condition, and other factors. Absolute longevity has not been determined, but ages greater than 30 years appear likely based on tagging and other population studies (VanBlaricom 1993).

Although once an important fishery resource throughout the region, landings peaked in 1973 and declined thereafter (Leet *et al.* 1992). Sport and commercial black abalone fisheries have been closed since 1993. Black abalone populations in southern California suffered catastrophic declines since the mid-1980s that resulted in nearly complete disappearance of black abalone along mainland shores south of Point Purisima (Miller and Lawrence-Miller 1993; Carr 1989), as well as at many of the Channel Islands (Lafferty and Kuris 1993; Richards and Davis 1993). Mortality was associated with "withering syndrome" (WS), in which the foot shrinks and weakened individuals lose their grip on rock surfaces (Antonio *et al.* 2000; Friedman *et al.* 1997; Gardner *et al.* 1995). WS or its prokaryotic infection has been observed in abalone north of Point Conception in recent years; however the disease is not widespread (Altstatt *et al.* 1996). Overfishing also played a role in the population declines (CDFG 2002). Other sources of mortality include smothering by sand burial, dislodgment by storm waves, and predation by octopus, sea stars, fishes, and sea otters (Morris *et al.* 1980; VanBlaricom 1993). Impacts from oil are little known, but North *et al.* (1964) reported black abalone mortality following a spill in Baja California. Because of low recruitment, slow growth, and already reduced reproductive populations, additional mortality from oil spills would further inhibit recovery.

Green Abalone (Haliotis fulgens)

Green abalone inhabit low intertidal levels to subtidal depths (to 18 meters) from southern California to southern Baja California (Morris *et al.* 1980). These warm-water abalone are identified by lighter, olive-green to red-brown, shell coloration, a finely ribbed shell with 5 to 7 open holes, relatively small size (usually less than 20 centimeters), and a green and brown mottled foot. Green abalone are relatively sedentary and are commonly found in deep crevices exposed to strong wave action. Adult population density may depend on the availability of suitable crevice habitats. They feed almost exclusively on large drift algae. This species may live 20 years (Leet *et al.* 1992). Green abalone was an important fishery in California, with landings peaking in 1971 and rapidly declining thereafter (Leet *et al.* 1992). Green abalones were most common at the southern Channel Islands (including Santa Barbara Island) and present at the northern Channel Islands, but are now rarely encountered. The green abalone commercial and sport fishery is currently closed. Sources of mortality include predation by octopus, sea stars, fishes, and sea otters.

Pink Abalone (Haliotis corrugata)

Pink abalone inhabit subtidal depths (to 60 meters) from southern California to central Baja California (Morris *et al.* 1980). They are identified by lighter, green or red-brown shell coloration, an irregularly ribbed shell with 2 to 4 open holes, an arched shell with a scalloped margin, relatively small size (usually less than 17 centimeters), and their black and white mottled foot. Pink abalone are sedentary, occupying a permanent scar on a home rock. This species occurs in partially sheltered waters, infrequently dwelling in

crevices. They feed almost exclusively on large drift algae. This species may live 20 years (Leet *et al.* 1992).

In the early 1950s, pink abalone comprised the largest segment of the abalone fishery, about 75 percent, and had a significant effect on the total abalone landings. Commercial landings originated at the eastern northern Channel Islands (Anacapa, Santa Cruz), and the southern Channel Islands (San Nicolas, Santa Catalina, Santa Barbara, San Clemente). Because pink abalone are more fragile than others and grow more slowly, the high level of take could not continue (Leet *et al.* 2001). Department research cruises to San Clemente, Santa Catalina, and Santa Barbara Islands in 1996 and 1997, were used to investigate pink, and other, abalones. The number of abalones sighted per unit of time was used to quantify stocks, and a factor was applied to estimate the number of commercially legal pink abalone that could be collected per hour. Estimates ranged from about one to 1.5 abalone per hour. Similar cruises conducted in 1999, estimated only 0.28 commercial legal pink abalone per hour. At Catalina Island, no commercial sized pink abalone were found.

Red Abalone (Haliotis rufescens)

Red abalone inhabit low intertidal levels to subtidal depths (to 26 meters, rarely to 180 meters) from Oregon to southern Baja California (Morris *et al.* 1980). They are identified by brick red shell coloration, an irregular shell surface with 3 to 4 open holes, and relatively large size (to 30 centimeters). These colder-water abalone are relatively sedentary on reef tops or in crevices. They feed on drift algae and, especially when young, on microscopic algal films. This species may live 20 years (Leet *et al.* 1992).

Red abalone were previously an important fishery in California, with landings peaking in 1967 and steadily declining thereafter (Leet *et al.* 1992). In central and southern California, red abalone declined less than the other five species by the time the fishery was closed in 1997 (Leet *et al.* 2001). Combined landings of red abalone declined during the period from 1969 to 1982 stabilizing at 1/10 their historic average during the 14 year period before the 1997 closure (Leet *et al.* 2001). Detailed examination of catch by area and fishery independent assessments reveal that the stability in landings masked ongoing reductions of local populations, as successive areas declined by over two orders of magnitude. From 1952 to 1968 most red abalone were caught in central California, followed by southern mainland, Santa Cruz, Santa Rosa and San Miguel Islands (Leet *et al.* 2001). Catches declined first along the central coast under the combined effects of expanding sea otters and fishing pressure. Outside the sea otter range catches declined more slowly along the southern mainland than at Santa Rosa, Santa Cruz, and San Nicolas Islands. From 1983-1996, catch decreased off these three islands to three percent, for Santa Rosa, and less than one percent, for Santa Cruz and San Nicolas, of their respective peak catches by the 1997 closure (Leet *et al.* 2001). San Miguel Island and the north coast were the exceptions to this pattern. Catches from San Miguel Island, the farthest and most northern of the Channel Islands, and the north coast comprised 71 of the 87 tons landed in 1996 prior to the fishery closure in 1997 (Leet *et al.* 2001). The red abalone commercial and sport fishery is currently closed, except for sport take by free divers in northern California. Other sources of mortality include predation by crabs, octopus, sea stars, fishes, and sea otters.

White Abalone (Haliotis sorenseni)

White abalone occur subtidally (about 20 to 65 meters) from southern California to southern Baja California. These deep-water abalone are readily identified by their red-brown shell color, a ribbed shell with 3 to 5 open holes, and a yellow-green and beige mottled foot. They grow to approximately 25 centimeters. Individuals up to about 25 years of age have been reported (Davis *et al.* 1996; Gotshall and Laurent 1979). White abalone are sedentary, inhabiting open, exposed deep-water reefs with a kelp understory. Adults consume drifting and attached macroalgae. Juveniles are cryptic, hiding in crevices

and beneath rocks where they feed on microalgal films (Davis *et al.* 1996). The white abalone fishery developed late with the first reported commercial landings in 1968; however, they were popular because the foot meat is tender. Abundances were highest at the southern and northeastern Channel Islands. Peak landings occurred in 1972 and decreased thereafter (Leet *et al.* 1992). Average density during periods of peak harvest in the 1970s was one abalone per square meter. Density has dramatically decreased since to 0.002 per square meter (Carlton *et al.* 1999). Surveys in the Channel Islands area found that density may have further decreased to 0.0001 per square meter (Davis *et al.* 1998). Since females must be within a few meters of a male during spawning for fertilization to occur, present population densities in the area may preclude successful spawning. Some sections of the white abalone fishery have been closed since 1977 and the entire fishery has been closed since 1993, though densities have continued to fall (Carlton *et al.* 1999; Davis *et al.* 1998). Subthreshold breeding density and continued predation (e.g., fish, octopus, and sea stars) suggest that recovery without significant human intervention is unlikely. Submersible surveys were carried out to further evaluate population status and to explore possibilities for collection of specimens for a captive breeding program. The rarity of this species prompted NMFS to list it as a candidate species under the Endangered Species Act in 1997. This action required a status review, which concluded that overexploitation was the major cause of the decline. Subsequently, in May 2000, the white abalone became the first marine invertebrate to receive Federal protection as an endangered species.

1.2.3.7 Limpets

Owl Limpet (Lottia gigantea)

Owl limpets are common in high and middle intertidal zones of exposed rocky shores from Washington south to Baja California. Adult *Lottia* are relatively easy to identify because of their large size (5 to 10 centimeters), oval shape with low rounded profile, and color patterns of brown, white, and black on the often eroded shell. Accessory gills on the mantle increase surface area for aerial respiration during low tide periods. Owl limpet habitats extend from the barnacle and *Endocladia* zones in the high intertidal zone down to the mussel beds in the mid tide zone. Owl limpets maintain feeding territories on relatively smooth rock surfaces which they keep free of (by rasping and bulldozing) most macroalgae and invertebrates (Stimpson 1970; Wright 1982). By removing most competitors they promote the growth of algal films upon which they systematically graze. These "clearings" vary in appearance with *Lottia* size and structural features of the substrate, creating a patchwork of differing microhabitats. *Lottia* tend to occupy one or more characteristic "home scars" within their territories. The limpets also may tuck into crevices and under mussels for protection from heat, desiccation, and high surf.

Lottia grow slowly, taking up to 10 to 15 years to reach maximum size (Morris *et al.* 1980). As an ecological dominant, any change in *Lottia* populations greatly affects abundances of other species. The limpets and their feeding territories are vulnerable to oiling, but oil impacts are unclear. For example, they were not obviously affected by the 1971 San Francisco oil spill (Chan 1973). Due to their slow growth, recovery from any major disturbance likely would be lengthy. Larger owl limpets are collected for food, tasting much like abalone (Murray 1998). Since the largest individuals are nearly always females (*Lottia* are protandrous hermaphrodites) (Wright and Lindberg 1982), collecting may impair reproductive capabilities within owl limpet populations.

1.2.3.8 Mussels, Clams, and Scallops

Mussels, clams, and scallops are mollusks of the Class Bivalvia. All bivalves have two hinged shells enclosing the rest of the animal. Bivalves feed by filtering particulate matter from sea water through their gills. They reside in or on the substrate as adults. Many species of bivalves occur in the Channel Islands area, with a sport fishery (for food or bait) being supported by the four species of particular interest

described below plus others including purple clams (*Nuttallia nuttallii*), Washington clams (*Saxidomus nuttallii*), jackknife clams (*Tagelus californianus*), gapers (*Tresus nuttallii*), spiny cockles (*Trachycardium quadragenarium*), abalone jingles (*Pododesmus sepio*), oysters, San Diego scallops (*Pecten diegenensis*), and speckled scallops (*Argopecten aquisulcatus*) (Thompson *et al.* 1993).

California Mussel (Mytilus californianus)

California mussels are abundant at middle to low levels of exposed rocky shores along the entire Pacific Coast. These 10- to 20-centimeter black/blue/gray mussels firmly attach to rocks or other mussels by tough byssal threads, forming dense patches or beds. The literature on *Mytilus californianus* is extensive, including key ecological studies on the effects of predation, grazing, and disturbance on succession and community structure (see for discussion Kinnetics, 1992; Morris *et al.* 1980; Ricketts *et al.* 1985). The bay mussel, *M. galloprovincialis* (formerly mis-identified as *M. edulis*), can co-occur with *M. californianus*, but is most common in sheltered habitats.

Thick (20 centimeters or more) beds of California mussels trap water, sediment, and detritus that provide food and shelter for a large diversity of plants and animals, including cryptic forms inhabiting spaces between mussels as well as biota attached to mussel shells (Kanter 1980; MacGinitie and MacGinitie 1968; Paine 1966; Suchanek 1979). For example, MacGinitie and MacGinitie (1968) counted 625 mussels and 4,096 other invertebrates in a single 25 square centimeter clump, and Kanter (1980) identified 610 species of animals and 141 species of algae from mussel beds at the Channel Islands. Kinnetics (1992) documented location differences in the composition and abundance of mussel bed species. Northern sites had densely packed, multi-layered beds, but the more open southern sites had higher species diversity. Mussels feed on suspended detritus and plankton. Young mussels settle preferentially into existing beds at irregular intervals, grow at variable rates depending on environmental conditions, and eventually reach ages of 8 years or more (Morris *et al.* 1980, Ricketts *et al.* 1985). Desiccation likely limits the upper extent of mussel beds, storms tear out various-sized mussel patches, and sea stars prey especially on lower zone mussels. Mussels are popularly harvested by sport collectors for food and bait. *Mytilus* are adversely affected by oil spills (Chan 1973; Foster *et al.* 1971). Recovery from disturbance varies from fairly rapid (if clearings are small and surrounded by mussels that can move in) to periods greater than 10 years (if clearings are large and recruitment is necessary for recolonization) (Kinnetics 1992; Vesco and Gillard 1980).

Pismo Clam (Tivela stultorum)

Pismo clams inhabit the intertidal zone to subtidal depths (to 25 meters, but mostly less than 7 meters) from Monterey to central Baja California. Adults are found along surf-swept sandy shores. Pismo clams are identified by light colored shell with fine concentric growth lines and short externally-visible siphons. Adult Pismo clams are buried in the substrate and are relatively sedentary. This species may live up to 50 years (Leet *et al.* 1992). Pismo clams have supported a commercial and sport fishery in California since at least 1916. Natural predators include sea stars, snails, fishes, birds, and sea otters. Natural populations of Pismo clams on the mainland have been studied by the Department since 1923. Pismo clams occur at two specific locations at the Channel Islands (at Santa Cruz and Santa Rosa Islands) (Dugan *et al.* 1993; Engle *et al.* 1998).

Geoduck (Panopea abrupta)

Geoducks inhabit low intertidal levels to subtidal depths (to 100 meters) from Alaska to central Baja California. Adults are found in the sandy mud of protected bays or in deep water soft substrates. Geoducks are identified by whitish shells with irregular concentric growth lines and a huge, externally visible siphon (to 1 meter long). Adult geoducks are buried in the substrate and are relatively sedentary.

This species has an extremely long life span (up to 146 years) (O'Clair and O'Clair 1998). Geoducks support a modest sport fishery in California, with divers or individuals on the beach digging up the clams. Their great depth in the sediment requires the use of high-pressure water jets for harvest which seriously disturbs the substrate. Some have expressed interest in developing such a fishery in southern California, but there is also concern about quickly overharvesting such long-lived animals. Natural predators of the geoduck are not known (Morris *et al.* 1980; O'Clair and O'Clair 1998). Populations of the geoduck are found around all four of the northern Channel Islands and along the coast south of Point Conception (Engle *et al.* 1998).

Rock Scallop (Crassidoma giganteum [= Hinnites giganteus])

Rock scallops inhabit low intertidal levels to subtidal depths (to 50 meters) from British Columbia (Canada) to central Baja California. In the Channel Islands, adults are found primarily on high-relief rocky reefs, pinnacles, and walls with moderate to high water motion. Rock scallops are identified by yellow-orange shell, orange flesh, blue eyes on tentacles at edge of mantle, and lack of a visible external siphon. The shell is frequently covered with fouling organisms. Adult rock scallops are attached to the substrate; post-larval juveniles (larger than 45 mm) can swim limited distances. This species may live up to 25 years (Leet *et al.* 1992). Rock scallops support a popular sport fishery for their tasty adductor muscle. It is difficult to assess the total fishery harvest of rock scallops, but nearly 1,000 were reported taken each year between 1978 and 1987 by divers aboard CPFVs, mostly at the Channel Islands (Leet *et al.* 2001). The sport fishery appears to have depleted some local populations. Known natural predators include sea stars although there are likely others. Populations of the rock scallop have not been well studied (Leet *et al.* 1992; Morris *et al.* 1980).

Market Squid (Loligo opalescens)

The California market squid occurs off southern Alaska to central Baja California. They inhabit pelagic coastal waters, congregating to spawn in semi-protected bays, usually over a sand bottom with rocky outcroppings. Spawning in the Channel Islands often occurs from October through May. The average age of squid from fishery samples is approximately 185 days old (Leet *et al.* 2001). Eggs are deposited on the bottom in clusters, with juveniles emerging within approximately one month. Adults die after spawning. The diet of squid consists of small pelagic crustaceans, fishes, benthic worms, and their own young. Market squid have been harvested in California since 1863. The California fishery shifted its emphasis to the region in 1961, where it is currently centered. The fishery has been marked by large-scale fluctuations in landings, with no apparent overall trend. Squid landings decrease greatly during strong El Nino events. Squid are harvested using strong lights over the water to attract schools of squid in relatively shallow spawning areas. Since 1984 squid landings have increased steadily to over 200 million pounds in 1999 with severe declines in 1992 and 1998 during strong El Nino events (Leet *et al.* 2001). The present status or structure of populations in the region is unclear and is presently being evaluated by the Department. However, historical evidence from research surveys and recent landing data indicate that the biomass is large (Leet *et al.* 2001).

Squid are important prey for numerous fishes, birds, and marine mammals and their eggs are eaten by benthic echinoderms (Morris *et al.* 1980, Leet *et al.* 1992). The market squid is one of the principal items of the diet of Dall's porpoise and Risso's dolphins, pilot whales, sea lions, and elephant seals (Bonnell and Dailey 1993). Overall, squid are an important part of many food webs in the SCB (Leet *et al.* 1992).

1.2.3.9 Sea Urchins

Sea urchins are benthic grazers relying on their outer covering of spines and tube feet for locomotion and protection. Five principal species occur within the Channel Islands: red, purple, white, coronado, and pink. The nocturnal, invertebrate-grazing coronado urchin (*Centrostephanus coronatus*) is a tropical species that reaches its northern limit at the Channel Islands. The pink urchin (*Allocentrotus fragilis*) occurs primarily on soft substrates at depths greater than 150 meters. Pink urchins are scavengers and often dominate the community in terms of biomass (Blake *et al.* 1996). The other urchins are major consumers of kelps and other algae. Red and purple urchins dwell in crevices and feed on drift kelp or emerge to consume attached plants (Morris *et al.* 1980; Leet *et al.* 1992). Urchin grazing may denude entire reefs of nearly all macroalgae, after which the urchins are capable of persisting in a near-starvation state, continuing to eat any newly settled plants (Ambrose *et al.* 1993; Carroll *et al.* 2000; Engle 1994; Harold and Reed 1985; Richards *et al.* 1997). These urchin barrens no longer support the highly diverse assemblages characteristic of balanced kelp-dominated ecosystems. Red, purple, and white urchins are susceptible to disturbance from major storms and a poorly understood disease that may dramatically reduce population sizes (Ebeling *et al.* 1985; Lafferty and Kushner 2000).

Red Urchin (Strongylocentrotus franciscanus)

Red urchins inhabit low intertidal to subtidal depths (to 90 meters) from Alaska to central Baja California. They prefer open rocky shores. Red urchins are identified by their red, maroon, or black color and large size (10 centimeters commonly, to 20 centimeters) (Leet *et al.* 1992; Morris *et al.* 1980). When food is abundant, red urchins are relatively sedentary. However, when food is scarce, red urchin motility increases (to 1 meter per day) (Harrold and Reed 1985). Red urchin spines are refuges for a variety of small invertebrates (including juvenile red urchins) and fishes (Tegner and Dayton 1977). The diet of red urchins consists of a variety of red and brown algae, but Giant kelp is preferred. Red urchins compete with abalone for food and space, though their spine canopy provides shelter for smaller abalone. Red urchins may live 20 years or more (Morris *et al.* 1980). A significant commercial fishery for red urchin began during the 1970s in the region (Leet *et al.* 1992). Commercial hookah divers harvest red urchins using rakes at depths of up to 33 meters.

The relative abundance of red urchins has declined since the 1970's (e.g., Carroll *et al.* 2000). In southern California, the red sea urchin resource now produces about 10 million pounds annually, with harvestable stocks (defined as exceeding the minimum legal size and containing marketable gonads) in decline since 1990 (Leet *et al.* 2001). Between 1985 and 1995, the percentage of legal-sized red sea urchins at survey sites in the northern Channel Islands declined from 15 percent to 7.2 percent (Leet *et al.* 2001). Although fishing has significantly reduced density in many areas and catch-per-unit of effort has decreased, localized juvenile recruitment has, thus far, somewhat mitigated fishing pressure (Leet *et al.* 2001). Consistent recruitment has been noted on artificial settlement substrates and along subtidal transects over the last decade at monitoring stations along the southern California mainland coast and the northern Channel Islands (Leet *et al.* 2001). This may be partly due to ocean current patterns in the SCB, where water retention may increase the chances for larvae to encounter habitat suitable for settlement. Continued recruitment at present levels, however, is not guaranteed; in fact, intensive sea urchin harvesting in northern California and Baja California could result in a decrease in sea urchin larvae in southern California in the future. Other sources of mortality include predation by sea stars, fishes, lobsters, and sea otters (Leet *et al.* 1992; Tegner and Dayton 1981; Tegner and Levin 1983; Rogers-Bennett 1998).

Purple Urchin (*Strongylocentrotus purpuratus*)

Purple urchins inhabit low intertidal to subtidal depths (to 160 meters) from southern British Columbia (Canada) to central Baja California. They prefer rocky habitats with moderate to strong wave action, where they normally inhabit crevices or depressions they create. Purple urchins are identified by their purple color and relatively small size (to 8 cm). The diet of purple urchins consists of a variety of red and brown algae, but giant kelp is preferred. They are relatively sedentary when food is abundant, with motility increasing as food availability decreases (to 1 meter per day) (Harrold and Reed 1985). This species may live at least 30 years (Morris *et al.* 1980).

Coincident with the decline of competing red urchins, purple urchins populations have increased tremendously at many island sites, creating vast areas denuded of macroalgae (Harold and Reed 1985; Ambrose *et al.* 1993; Engle 1994; Richards *et al.* 1997; Carroll *et al.* 2000, Lafferty and Kushner 2000). A small fishery has existed sporadically for this species which peaked in 1992 at 400,000 pounds and then declined to less than 50,000 pounds in 1999 (Leet *et al.* 2001). A limited amount of this harvest has come from the Channel Islands.

White Urchin (*Lytechinus anamesus*)

White urchins inhabit subtidal depths (2 to 300 meters) from the Channel Islands to central Baja California. They prefer soft substrates where they often occur in high densities. They can be one of the most dominant megafaunal species on deep-water mainland shelves (Thompson *et al.* 1993). They also periodically invade some shallow-water sand and rock habitats (Ambrose *et al.* 1993; Engle 1994; Richards *et al.* 1997; Carroll *et al.* 2000). White urchins are identified by their whitish color, small size (to 4 cm), and fragile test. White urchins are extremely effective grazers, capable of consuming kelp and other algae when density is high (Morris *et al.* 1980; Ambrose *et al.* 1993; Engle 1994; Richards *et al.* 1997; Carroll *et al.* 2000). In the Channel Islands, feeding fronts of white urchins apparently have eliminated eelgrass beds on the north side of Anacapa Island (Engle 1994). White urchins may also consume invertebrates, including other urchins (Coyer *et al.* 1987). There is no fishery for these small urchins. Predators of white urchins include sea stars and fishes (Schroeter *et al.* 1983).

1.2.3.10 Sea Cucumbers

Sea cucumbers are benthic animals with a variety of feeding strategies, from planktivory to bottom feeding (Morris *et al.* 1980). At least 12 species are known to occur in the Channel Islands though two (California and Warty sea cucumbers) are of particular interest as they support an expanding commercial fishery which began in 1978 and peaked in 1998 at nearly 900,00 pounds (Leet *et al.* 2001). It is apparent that harvesting has significantly reduced some sea cucumber populations.

California Sea Cucumber (*Parastichopus californicus*)

California sea cucumbers inhabit low intertidal levels to subtidal depths (to 90 meters) from Alaska to central Baja California; however, they rarely occur at depths above 30 meters in the region. Here, they occur predominantly on deep-water, soft-bottom habitats. These colder-water sea cucumbers are identified by their red, brown, or yellow color, large stiff papillae, and large size (to 40 centimeters). Although relatively sedentary, they may move up to 4 meters per day (Lambert 1997). The diet of California sea cucumbers consists of detritus and small organisms, which they ingest with bottom sediments. No sport fishery for this species exists. A commercial fishery using trawl gear for California sea cucumbers started in California in 1978 and dominated total sea cucumber landings until 1996 (Leet *et al.* 2001). In 1982, the center of the fishery shifted to the CINMS where they are harvested from the

Santa Barbara Channel by trawling. This species may live about 12 years. (Morris *et al.* 1980; Leet *et al.* 1992). Sources of mortality other than fishing include predation by sea stars, fishes, and crabs.

Warty Sea Cucumber (*Parastichopus parvimensis*)

Warty sea cucumbers inhabit low intertidal levels to subtidal depths (to 27 meters) from Monterey Bay to central Baja California. These warmer-water sea cucumbers are common on both soft substrates and rocky reefs. Warty sea cucumbers are identified by their light-brown color, dorsal papillae, and smaller size than the California sea cucumber (to 25 centimeters). Warty sea cucumbers are common in the Channel Islands, though natural populations are poorly studied (Gotshall and Laurent 1979; Morris *et al.* 1980). This slow-moving sea cucumber feeds on detritus and small organisms, which it ingests with bottom sediments. It may live about 12 years (Morris *et al.* 1980; Leet *et al.* 1992). No sport fishery for this species exists. A commercial fishery by hookah divers using rakes started in California in 1978 (Leet *et al.* 1992). Initially, total sea cucumber landings were dominated by the trawl caught California sea cucumber, but since 1997 the total landings have been consisted of over 80 percent of the diver caught Warty sea cucumbers (Leet *et al.* 2001). Other sources of mortality include predation by sea stars, fishes, crabs, and sea otters, and a bacterial disease that may significantly reduce population sizes (Eckert *et al.* 2000; Engle 1994).

Ochre Sea Star (*Pisaster ochraceus*)

Ochre sea stars are found on middle and low tide levels of wave-swept rocky coasts from Alaska to Baja California, but they are much less common south of Point Conception. Their relatively large size (to 45 centimeters diameter), variety of colors (yellow, orange, purple, brown), and ability to withstand air exposure (at least 8 hours) attract considerable attention from visitors exploring the shore at low tide. The ochre sea star typically is associated with mussels, which constitute its chief food, but barnacles, limpets, snails, and chitons also may be taken (Morris *et al.* 1980).

Predator-prey interactions involving ochre sea stars have been intensely studied, especially the role of *P. ochraceus* in determining the lower limit of northern mussel beds (Dayton 1971; Paine 1966, 1974). Like black abalone, ochre sea stars are relatively slow-growing, long-lived, and apparently variable in recruitment success. Tolerant of high surf, they use their numerous tube feet to remain firmly in place, often in cracks and crevices. They have few predators, except for the occasional sea gull or sea otter and curious tidepool visitor. However, in southern California, *P. ochraceus* populations have been decimated by a widespread wasting disease caused by a warm-water bacterium of the genus *Vibrio* (Eckert *et al.* 2000). Sensitivity to oil spills is not well known; Chan (1973) saw no obvious effects from a San Francisco oil spill. Due to their slow growth and low reproductive success recovery time from any major population loss likely would be very long.

1.2.4 Fishes

About 481 species of fish inhabit the SCB (Cross and Allen 1993). The great diversity of species in the area occurs for several reasons: (1) the ranges of many temperate and tropical species extend into and terminate in the SCB, (2) the area has complex bottom topography and a complex physical oceanographic regime that includes several water masses and a changeable marine climate (Cross and Allen 1993; Horn and Allen 1978), and (3) the islands and nearshore areas provide a diversity of habitats that include soft bottom, rock reefs, extensive kelp beds, and estuaries, bays, and lagoons.

The fish species found around the Channel Islands generally are representative of fish assemblages that occur along the southern California coast, with the addition of some central California species (Hubbs 1974). Eschemeyer *et al.* (1983) list 406 fish species whose ranges include the CINMS (Table C-3).

**Table C-3
Common Fish Species Found in the CINMS**

Common Name	Scientific Name
Albacore	<i>Thunnus alalunga</i>
Anchovy, Northern	<i>Engraulis mordax</i>
Barracuda, Pacific	<i>Sphyrnaea argentea</i>
Bass, Barred Sand	<i>Paralabrax nebulifer</i>
Bass, Giant Sea	<i>Stereolepis gigas</i>
Bass, Kelp	<i>Paralabrax clathratus</i>
Bass, Spotted Sand	<i>Paralabrax maculatofasciatus</i>
Bat Ray	<i>Myliobatis californica</i>
Blacksmith	<i>Chromis punctipinnis</i>
Bonito, Pacific	<i>Sarda chiliensis</i>
Brown Smoothhound	<i>Mustelus henlei</i>
Butterfish, Pacific	<i>Peprilus simillimus</i>
Ca. Scorpionfish (Sculpin)	<i>Scorpaena guttata</i>
Cabazon	<i>Scorpaenichthys marmoratus</i>
California Sheephead	<i>Semicossyphus pulcher</i>
California Moray	<i>Gymnothorax nordax</i>
California Scorpionfish	<i>Scorpaena guttata</i>
California Flyingfish	<i>Cypelurus californicus</i>
California Halibut	<i>Paralichthys californicus</i>
Croaker, White	<i>Genyonemus lineatus</i>
Croaker, Black	<i>Cheilotrema saturnum</i>
Croaker, Yellowfin	<i>Umbrina roncador</i>
Eel, Monkeyface	<i>Cebidichthys violaceus</i>
Garibaldi	<i>Hypsypops rubicundus</i>
Goby, Bluebanded	<i>Lythrypnus dalli</i>
Goby, Blackeye	<i>Coryphopterus nicholsi</i>
Goby, Zebra	<i>Lythryphus zebra</i>
Greenling, Kelp	<i>Hexagrammos decagrammus</i>
Greenling, Painted	<i>Oxylebius pictus</i>
Greenling, Rock	<i>Hexagrammos lagocephalus</i>
Grunion	<i>Leuresthes tenuis</i>
Gunnel, Kelp	<i>Ulvicola sanctaerosae</i>
Hake, Pacific	<i>Merluccius Productus</i>
Half Moon	<i>Medialuna californiensis</i>
Horn Shark	<i>Heterodontus francisci</i>

Table C-3, Page 1 of 4

**Table C-3
Common Fish Species Found in the CINMS (Continued)**

Common Name	Scientific Name
Jacksmelt	<i>Atherinops californiensis</i>
Kelpfish, Island	<i>Alloclinus holderi</i>
Kelpfish, Crevice	<i>Gibbonsia montereyensis</i>
Kelpfish, Giant	<i>Heterostichus rostratus</i>
Kelpfish, Spotted	<i>Gibbonsia elegans</i>
Lingcod	<i>Ophiodon elongatus</i>
Mackerel, Pacific	<i>Scomber japonicus</i>
Mackerel, Jack	<i>Trachurus symmetricus</i>
Northern Ronquil	<i>Ronquilus Jordani</i>
Ocean Sunfish	<i>Mola mola</i>
Opah	<i>Lampris guttatus</i>
Opaleye	<i>Girella nigricans</i>
Orangethroat Pikeblenny	<i>Chaenopsis alepidota</i>
Queenfish	<i>Seriphus politus</i>
Reef Perch	<i>Micrometrus aurora</i>
Rock Wrasse	<i>Halichoeres semicinctus</i>
Rockfish, Gopher	<i>Sebastes carnatus</i>
Rockfish, Yellowtail	<i>Sebastes flavidus</i>
Rockfish, Black	<i>Sebastes melanops</i>
Rockfish, Black and Yellow	<i>Sebastes chrysomelas</i>
Rockfish, Blue	<i>Sebastes mystinus</i>
Rockfish, Bocaccio	<i>Sebastes paucispinis</i>
Rockfish, Brown	<i>Sebastes auriculatus</i>
Rockfish, Calico	<i>Sebastes dalli</i>
Rockfish, Calico	<i>Sebastes dalli</i>
Rockfish, Canary	<i>Sebastes pinniger</i>
Rockfish, China	<i>Sebastes nebulosus</i>
Rockfish, Copper	<i>Sebastes caurinus</i>
Rockfish, Vermillion	<i>Sebastes miniatus</i>
Rockfish, Grass	<i>Sebastes rastrelliger</i>
Rockfish, Halfbanded	<i>Sebastes semicinctus</i>
Rockfish, Kelp	<i>Sebastes atrovirens</i>
Rockfish, Olive	<i>Sebastes serranoides</i>
Rockfish, Rosy	<i>Sebastes rosaceus</i>
Rockfish, Stripetail	<i>Sebastes saxicola</i>
Rockfish, Tree	<i>Sebastes serripes</i>

Table C-3, Page 2 of 4

**Table C-3
Common Fish Species Found in the CINMS (Continued)**

Common Name	Scientific Name
Rockfish, Yelloweye	<i>Sebastes rubrivimus</i>
Rockfish, Tiger	<i>Sebastes nigrocinctus</i>
Ronquil, Stripedfin	<i>Rathbunella hypoplecta</i>
Salmon, King	<i>Oncorhynchus Tshawytscha</i>
Sanddab, Pacific	<i>Citharichthys sordidus</i>
Sanddab, Speckled	<i>Citharichthys stigmaeus</i>
Sarcastic Fringehead	<i>Neoclinus blanchardi</i>
Sardine, Pacific	<i>Sardinops sagax</i>
Sargo	<i>Anisotremus davidsoni</i>
Saury, Pacific	<i>Coloabis saira</i>
Sculpin, Snubnose	<i>Orthonopias Triacis</i>
Sculpin, Scalyhead	<i>Artedius harringtoni</i>
Sculpin, Wooly	<i>Clinocotius analis</i>
Seaperch, Sharpnose	<i>Phanerodon atripes</i>
Seaperch, Striped	<i>Embiotoca lateralis</i>
Seaperch, Rubberlip	<i>Rhacochilus toxotes</i>
Seaperch, Rainbow	<i>Hypsurus caryi</i>
Señorita	<i>Oxyjulis californuca</i>
Shark, Blue	<i>Prionace glauca</i>
Shark, Mako	<i>Isurus oxyrnchus</i>
Shark, Soupfin	<i>Galeorhinus galeus</i>
Shark, Spiny Dogfish	<i>Squalus acanthias</i>
Shark, Swell	<i>Cephaloscyllium ventriosum</i>
Shark, Thresher	<i>Alopias vulpinus</i>
Shark, White	<i>Carcharodon carcharias</i>
Shark, Leopard	<i>Triakis semifasciata</i>
Siversides	<i>Atherinidae</i>
Sole, Sand	<i>Psettichthys melanostictus</i>
Sole, English	<i>Pleuronectes vetulus</i>
Sole, Rock	<i>Pleuronectes bilineatus</i>
Spotted Cusk-eel	<i>Chilara taylori</i>
Spotted Turbot	<i>Pleuronichthys ritteri</i>
Surfperch, Barred	<i>Amphistichus argenteus</i>
Surfperch, Black	<i>Embiotoca jacksoni</i>
Surfperch, Island	<i>Cymatogaster gracilis</i>

Table C-3, Page 3 of 4

**Table C-3
Common Fish Species Found in the CINMS (Continued)**

Common Name	Scientific Name
Surfperch, Kelp	<i>Brachyistius frenatus</i>
Surfperch, Pile	<i>Damalichthys vacca</i>
Surfperch, Pink	<i>Zalembeius rosaceus</i>
Surfperch, Shiner	<i>Cymatogaster aggregata</i>
Surfperch, Spotfin	<i>Hyperprosopon anale</i>
Surfperch, Calico	<i>Amphistichus koelzi</i>
Surfperch, White	<i>Phanerodon furcatus</i>
Surfperch, Walleye	<i>Hyperprosopon argenteum</i>
Swordfish	<i>Xiphias gladius</i>
Thornback	<i>Platyrrhinoidis triseriata</i>
Topsmelt	<i>Atherinops affinis</i>
Tube Snout	<i>Aulorhynchus flavidus</i>
Turbot, Hornyhead	<i>Pleuronichthys verticallis</i>
Turbot, Curlfin	<i>Pleuronichthys decurrens</i>
Turbot, C-O	<i>Pleuronichthys coenosus</i>
White Sea Bass	<i>Atractoscion nobilis</i>
Whitespotted Greenling	<i>Hexagrammos stelleri</i>
Yellowfin Fringehead	<i>Neoclinus stephensae</i>
Zebra Perch	<i>Hermosilla azurea</i>

Table C-3, Page 4 of 4
Source: CDFG 2002.

1.2.4.1 Nearshore Fish

Abundance of fish assemblages is greater at the northern Channel Islands than at nearby coastal regions of the southern California mainland. One reason for this is the high quality of nearshore habitats associated with the northern Channel Islands.

Fish abundance on nearshore reefs is related to the presence or absence of kelp and substrate topography. The abundance of water column fish such as kelp surfperch (*Brachyistius frenatus*), kelp bass (*Paralabrax clathratus*), giant kelpfish (*Heterostichus rostratus*), and kelp rockfish (*Sebastes atrovirens*) are directly correlated with kelp density. Kelp beds are not important spawning areas for fish, but they are important nursery areas for juvenile fishes. Juvenile and adult kelp bass occur in both kelp beds and on rocky reefs devoid of kelp (Cross and Allen 1993).

Hard substrates are the least abundant, but among the most important of fish habitats in the SCB (Cross and Allen 1993). About 30 percent of the species and 40 percent of fish families in the SCB occupy this habitat (Cross and Allen 1993). The composition of reef fish assemblages is influenced by the physical characteristics of the reef (Ebeling *et al.* 1980a,b; Larson and DeMartini 1984), and by water temperatures (Stephens and Zerba 1981; Stephens *et al.* 1984). Shelter-seeking species such as blacksmith (*Chromis punctipinnis*), garibaldi (*Hypsopops rubicundus*), grass rockfish, (*Sebastes rastrelliger*) brown rockfish

(*Sebastes auriculatus*) and gopher rockfish (*Sebastes carnatus*) are abundant on high-relief reefs, but they are rare or absent on low-relief reefs (Larson and DeMartini 1984).

In the northern SCB, the kelp canopy is dominated by plankton-eating and kelp-browsing species such as blacksmith, kelp surfperch, blue rockfish (*Sebastes mystinus*) juvenile olive rockfish and senorita (Ebeling *et al.* 1980 a, b). The canopy assemblage is made up of large populations of just a few species of fish (Cross and Allen 1993). The most common, conspicuous fish in the canopies of kelp beds on high-relief bench reefs off Santa Barbara and Santa Cruz Island are blue rockfish (41 percent) and kelp surfperch (35 percent) respectively (Ebeling *et al.* 1980a). Blacksmith represent 36 and 33 percent of the assemblages at these locations, respectively. Fish that ambush their prey or graze, such as pile surfperch, (*Damalichthys vacca*) black surfperch, garibaldi, California sheephead (*Semicossiphilus pulcher*) gopher rockfish (*Sebastes carnatus*) and black-and-yellow rockfish (*Sebastes chrysomelas*) occupy the reef itself. The kelp bed bottom assemblages consist of smaller populations of a relatively larger number of fish species. The most common fishes near the bottom of the Santa Barbara kelp bed are black surfperch (28 percent); at Santa Cruz Island, kelp bass (14 percent).

The rocky intertidal is a turbulent and dynamic environment where fish must cope with waves, surge and physiological stresses imposed by the ebb and flow of tides. Only six species of fish reside in the rocky intertidal including woolly sculpin (*Clinocottus analis*), reef finspot (*Paraclinus integripinnis*), rockpool blenny (*Hypsoblennius gilberti*), spotted kelpfish (*Gibbonsi elegans*), and California clingfish (*Gobiosox rhessodon*) (Cross and Allen 1993).

1.2.4.2 Skates and Rays

Skates and rays are not specifically sought by commercial fishermen, but are taken incidentally, primarily by bottom trawlers in central and northern California waters (Leet *et al.* 2001). Of the species identified in the commercial catch the most common are the shovelnose guitarfish (*Rhinobatos productus*), bat ray (*Myliobatis californica*), big skate (*Raja binoculata*), and thornback (*Platyrrhinoidis triseriata*). This does not represent the true catch composition, however, as 98 percent of the landings are listed as “unidentified skate” (Leet *et al.* 2001). A few nearshore species, most commonly the bat ray and shovelnose guitarfish, are the target of small sport fisheries.

Rays and skates occur in all marine habitats, from protected bays and estuaries to open seas, ranging from the surface to 9,500 feet deep (Leet *et al.* 2001). While some species are common, others are known from only a few specimens. From 1916 to 1990, skate landings, which ranged from 36,247 pounds (1916) to 631,240 pounds (1981), comprised two to 90 percent of the total elasmobranch catch (11.8 percent average) (Leet *et al.* 2001). Like the shark fishery, which had peaks from 1937 to 1948, and more recently from 1976 to 1990, the skate catch has fluctuated widely during the last half century (Leet *et al.* 2001). In the past 10 years, however, skate and ray landings have increased nearly ten-fold in California, from around 228,566 pounds in 1989 to 1,912,695 pounds in 1999 (Leet *et al.* 2001). This trend is most notable in the trawl fishery after 1994.

Some of the apparent increase may be due to increased landings of previously discarded catch. In 1994, the commercial groundfish fishery was divided into limited entry and open access components, each with new regulations and quotas. Groundfish quotas for both components were significantly reduced in the period from 1994 through 1999, leaving more space in the boats' holds for non-quota species. Trawl vessels may have supplemented their groundfish landings with skate and ray bycatch. There is considerable uncertainty whether the total impact on the skate and ray resource has increased or if more of the catch is being retained and landed (Leet *et al.* 2001).

The impact of sport fisheries on skates and rays is relatively unknown. Data from 48 shark derbies in Elkhorn Slough from 1950 to 1990 show, however, that shovelnose guitarfish, which in the 1950s and 1960s were the second, and in some years the most abundantly caught elasmobranch, virtually disappeared from the catch in later years (Leet *et al.* 2001). In the 1990s, there was a two-thirds decrease in the catch-per-unit effort for bat rays compared to the 1950s catch rates in these derbies (Leet *et al.* 2001). MRFSS data, however, show continued catches of bat rays, big skates, shovelnose guitarfish, and thornback. The total numbers caught are hard to determine from the numbers of sampled skates and rays, as sampled catch numbers vary widely from year to year (Leet *et al.* 2001).

Based on existing data, little can be said about the current or past population levels of California's skates and rays (Leet *et al.* 2001). While landings are increasing dramatically, this may or may not reflect an actual threat to the resource. Fish that were discarded in the past, dead and alive, are now being retained and landed. Other regions have already witnessed decreases in skate and ray populations and the population status warrants close monitoring.

1.2.4.3 Nearshore Epipelagic Species

Nearshore epipelagic fishes found within the CINMS include California barracuda (*Sphyraena argentea*), Pacific bonito (*Sarda chiliensis*), white seabass (*sarda chiliensis*) and yellowtail (*Seriola lalandi*). More information about these species can be found in Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html.

1.2.4.4 Groundfish

Groundfish species found within the CINMS include bocaccio (*Sebastes paucispinis*), cowcod (*Sebastes levis*), chilipepper (*Sebastes goodei*), widow rockfish (*Sebastes entomelas*), bank rockfish (*Sebastes rufus*), dover sole (*Microstomus pacificus*), English sole (*Pleuronectes vetulus*) and sablefish (*Anoplopoma fimbria*). More information about these species can be found in Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html.

1.2.4.5 Coastal Pelagic Species (CPS)

Coastal pelagic species found within the CINMS include Pacific sardine (*Sardinops sajax*), Northern anchovy (*Engraulis mordax*), Pacific mackerel (*Scomber japonicus*) and jack mackerel (*Trachurus symmetricus*). More information about these species can be found in Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html.

1.2.4.6 Highly Migratory Species

Highly migratory fish species found within the CINMS region include albacore (*Thunnus alalunga*), swordfish (*Xiphias gladius*), Pacific northern bluefin tuna (*Thunnus orientalis*), skipjack tuna (*Katsuwonus pelamis*), yellowfin tuna (*Thunnus albacares*), striped marlin (*Tetrapturus audax*), shortfin mako shark (*Isurus oxyrinchus*), thresher shark (*Alopias vulpinus*), blue shark (*Prionace glauca*), opah (*Lampris guttatus*), louvar (*Luvarus imperialis*) and dolphin (*Coryphaena hippurus*). More information about these species can be found in Marine Protected Areas in NOAA's Channel Islands National Marine Sanctuary – Final Environmental Document (2002), available on line at http://www.dfg.ca.gov/mrd/ci_ceqa/index.html.

Regional upwelling carries nutrient-rich waters from canyons and island shelf areas to the photic zone resulting in increased primary productivity and larger zooplankton populations, which support exceptionally abundant populations of small schooling species such as the northern anchovy, Pacific saury (*Cololabis saira*), Pacific sardine, and Pacific jack mackerel. These fish are in turn preyed upon by larger pelagic fish, and together they form a significant contribution to the forage base of marine mammals and birds. Schooling species found in offshore waters include northern anchovy, Pacific sardine, yellowfin tuna (*Thunnus albacares*), bluefin tuna (*T. thynnus*), albacore (*T. alalunga*), Pacific bonito and salmon (*Oncorhynchus spp.*). Northern anchovy and Pacific sardine are among the most abundant species and are the major prey of the mackerel and bonito; northern anchovy, Pacific sardine, mackerel, and bonito form the food base for the tuna.

The largest habitat in the SCB is the pelagic (open water) zone. Forty percent of the fish species in the SCB occupy this habitat, which has three vertical subzones (epipelagic, mesopelagic, and bathypelagic). The epipelagic zone is dominated by small, schooling fish such as northern anchovy, Pacific sardine and Pacific mackerel, which feed on plankton; by predatory schooling fish such as Pacific bonito and yellowtail; and by large, solitary predators like blue shark (*Prionace glauca*) and swordfish (*Xiphias gladius*) (Bedford and Hagerman 1983; Cailliet and Bedford 1983; Mais 1974, 1977; Squire 1983). Northern anchovy and Pacific Sardine are the most abundant epipelagic fish and may be the usually dominant species (MacCall *et al.* 1976; Squire 1983). However, abundance of epipelagic fishes varies with the seasons. Anchovy schools are more abundant and larger in the inshore areas of the northern SCB during the summer and fall (Cross and Allen 1993). From late winter to spring, anchovy schools move offshore to spawn (Mais 1974, 1977). Yellowtail migrate into the SCB from Baja California in the spring when surface water temperatures begin to warm. They spawn offshore in the summer and return south in the fall (Cross and Allen 1993).

The pelagic zone plays a critical role in sustaining fish populations because the eggs of nearly all fish are either deposited or hatched there. Even the larvae of fish that bear live young or attach eggs to the substrate (Cross and Allen 1993) spend the initial portion of their lives in the pelagic zone. Microscopic fish larvae are known as ichthyoplankton. The abundance of ichthyoplankton is greatest in the SCB and off northern Baja California (Cross and Allen 1993). The ichthyoplankton population of the SCB within 62 miles (100 kilometers) from the coast is dominated by northern anchovy larvae (83 percent). Rockfish (*Sebastes spp.*) and California smoothtongue (*Leuroglossus stilbius*) larvae each represent 4 percent of the ichthyoplankton population. Larvae of other species, such as white croaker, pacific hake, and California halibut form 2 percent or less of ichthyoplankton in the SCB (Gruber *et al.* 1982). Research on ichthyoplankton dynamics in the SCB has focused primarily on Pacific sardine, northern anchovy, and Pacific mackerel (Hunter 1981; Sherman *et al.* 1983).

1.2.5 Seabirds

Over 195 species of birds use open water, shore, or island habitats in the SCB south of Point Conception (Baird 1990). Many of these species are found in the CINMS (Table C-4). The Channel Islands region is located along the Pacific Flyway, a major migratory route for birds, and acts as a stopover during both north (April through May) and south (September through December) migrations. The months of June and July are peak months for transient seabirds (Lehman 1994). The Channel Islands provide breeding and nesting sites for many species and large numbers of seabirds, including many threatened and endangered species (Table C-5). The diversity of habitats provided both on- and offshore also contributes to the high species diversity in the region (Figure C-4). Sandy beaches provide foraging and resting habitat for a number of seabirds including black-bellied plover, willet, whimbrel, long-billed curlew, gulls, and sanderlings. The upland portions of the beach provide kelp deposits that attract invertebrates where black and ruddy turnstones, dowitchers, and other seabird species forage.

Table C-4
Seabirds Associated with the CINMS

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
<u>Loons (offshore)</u>	Family: Gaviidae	
Red throated Loon	<i>Gavia stellata</i>	Common visitor in winter; rare, but regular in summer
Pacific Loon	<i>Gavia pacifica</i>	Uncommon visitor in winter; abundant in spring; rare to locally uncommon in summer; common in fall
Common Loon	<i>Gavia immer</i>	Winter visitor; rare in spring; rare but regular in summer
Yellow-billed Loon	<i>Gavia adamsii</i>	Casual winter visitor
<u>Grebes (offshore)</u>	Family: Podicipedidae	
Pied-billed Grebe	<i>Podilymbus podiceps</i>	Winter visitor; fairly common summer resident
Horned Grebe	<i>Podiceps auritus</i>	Winter visitor; very rare in summer
Red-necked Grebe	<i>Podiceps grisegena</i>	Winter visitor; very rare fall transient
Eared Grebe	<i>Podiceps nigricollis</i>	Winter visitor; very rare in summer
Western Grebe	<i>Aechmophorus occidentalis</i>	Winter visitor; several spring breeding records; uncommon to locally common in summer
Clark's Grebe	<i>Aechmophorus clarkii</i>	Winter visitor; several spring breeding records; very uncommon to locally common in summer
<u>Albatrosses (offshore)</u>	Family: Diomedidae	
Black-footed Albatross	<i>Phoebastria nigripes</i>	Uncommon to rare visitor in fall/winter; uncommon in spring/summer
Laysan Albatross	<i>Diomedea immutabilis</i>	Rare but regular visitor in winter/summer/fall
<u>Fulmars (offshore)</u>	Family: Procellariidae	
Northern Fulmar	<i>Fulmarus glacialis</i>	Winter/spring/fall visitor; very rare in summer
<u>Petrels (offshore)</u>	Family: Procellariidae	
Mottled Petrel	<i>Pterodroma inexpectata</i>	Casual winter visitor offshore
Murphy's Petrel	<i>Pterodroma ultima</i>	Very rare visitor well offshore
Cook's Petrel	<i>Pterodroma cookii</i>	Casual winter visitor; very rare visitor well offshore in spring/summer
Stejneger's Petrel	<i>Pterodroma longirostris</i>	Casual winter visitor
<u>Shearwaters (offshore)</u>	Family: Procellariidae	
Pink-footed Shearwater	<i>Puffinus creatopus</i>	Very rare in winter; common visitor in spring/summer

Table C-4, Page 1 of 7

**Table C-4
Seabirds Associated with the CINMS (Continued)**

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
Flesh-footed Shearwater	<i>Puffinus carneipes</i>	Casual visitor offshore
Buller's Shearwater	<i>Puffinus bulleri</i>	Very rare fall visitor well offshore
Sooty Shearwater	<i>Puffinus griseus</i>	Common to abundant visitor in spring/summer/fall; very rare but regular in winter
Short-tailed Shearwater	<i>Puffinus tenuirostris</i>	Very rare winter visitor
Black-vented Shearwater	<i>Puffinus opisthomelas</i>	Rare winter visitor; casual in spring/summer; common to uncommon in fall
<u>Storm-Petrels (offshore)</u>	<i>Family: Hydrobatidae</i>	
Wilson's Storm-Petrel	<i>Oceanites oceanicus</i>	Casual visitor
Fork-tailed Storm-Petrel	<i>Oceanodroma furcata</i>	Casual visitor in winter/spring
Leach's Storm-Petrel	<i>Oceanodroma leucorhoa</i>	Uncommon to common in winter/spring/fall; uncommon in summer, breeds on islands
Ashy Storm-Petrel	<i>Oceanodroma homochroa</i>	Casual visitor in winter; common resident in spring/summer/fall. Breeds on San Miguel and Santa Cruz Islands
Wedge-rumped Storm-Petrel	<i>Oceanodroma tethys</i>	Casual winter visitor
Black Storm-Petrel	<i>Oceanodroma melania</i>	Fairly common to common summer visitor, breeds on islands
Least Storm-Petrel	<i>Oceanodroma microsoma</i>	Irregularly uncommon to fairly common summer/fall visitor
<u>Tropicbirds (offshore)</u>	<i>Family: Phaethontidae</i>	
Red-billed Tropicbird	<i>Phaethon aethereus</i>	Very rare summer/fall visitor
Red-tailed Tropicbird	<i>Phaethon rubricauda</i>	Casual visitor
<u>Pelicans (onshore and offshore)</u>	<i>Family: Pelecanidae</i>	
American White Pelican	<i>Pelecanus erythrorhynchos</i>	Rare to very rare winter visitor
California Brown Pelican	<i>Pelecanus occidentalis californicus</i>	Common year-round. Breeds on Anacapa, Santa Cruz, Santa Barbara islands

Table C-4, Page 2 of 7

**Table C-4
Seabirds Associated with the CINMS (Continued)**

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
<u>Cormorants (onshore and offshore)</u>	<i>Family:</i> <i>Phalacrocoracidae</i>	
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	Winter visitor, uncommon and local in summer, breeds on islands
Brandt's Cormorant	<i>Phalacrocorax penicillatus</i>	Common to very common winter visitor. Breeds on Channel Islands
Pelagic Cormorant	<i>Phalacrocorax pelagicus</i>	Fairly common to common winter visitor; fairly common summer resident, breeds on islands.
<u>Frigatebirds (offshore)</u>	<i>Family: Fregatidae</i>	
Magnificent Frigatebird	<i>Fregata magnificens</i>	Rare summer visitor
<u>Geese (onshore and offshore)</u>	<i>Family: Anatidae</i>	
Brant	<i>Branta bernicla</i>	Rare winter and fall visitor; common to abundant transient just offshore in spring; very rare in summer
<u>Scoters (offshore)</u>	<i>Family: Anatidae</i>	
Surf Scoter	<i>Melanitta perspicillata</i>	Common winter visitor; rare to uncommon in summer
White-winged Scoter	<i>Melanitta fusca</i>	Transient winter visitor
<u>Plovers (onshore)</u>	<i>Family: Charadriidae</i>	
Black-bellied Plover	<i>Pluvialis squatarola</i>	Common winter visitor; uncommon to fairly common but local in summer
American Golden Plover	<i>Pluvialis dominica</i>	Casual spring transient; rare in fall
Pacific Golden Plover	<i>Pluvialis fulva</i>	Very rare in winter; very rare transient in spring; rare in fall
Western Snowy Plover	<i>Charadrius alexandrinus</i>	Fairly common, but local winter visitor; spring resident; uncommon to fairly common but local in summer, breeds on islands.
Semipalmated Plover	<i>Charadrius semipalmatus</i>	Uncommon and local winter visitor; fairly common transient in spring/fall; a few individuals in summer
Killdeer	<i>Charadrius vociferus</i>	Common permanent resident year round, breeds on islands

Table C-4, Page 3 of 7

Table C-4
Seabirds Associated with the CINMS (Continued)

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
<u>Oystercatchers (onshore)</u>	<i>Family:</i> <i>Haematopodidae</i>	
Black Oystercatcher	<i>Haematopus bachmani</i>	Uncommon permanent resident year round, breeds on islands
<u>Stilts (onshore)</u>	<i>Family:</i> <i>Recurvirostridae</i>	
Black-necked Stilt	<i>Himantopus mexicanus</i>	Uncommon to rare in winter; uncommon resident in summer
<u>Avocets (onshore)</u>	<i>Family:</i> <i>Recurvirostridae</i>	
American Avocet	<i>Recurvirostra americana</i>	Fairly common transient
<u>Yellowlegs (onshore)</u>	<i>Family: Scolopacidae</i>	
Greater Yellowlegs	<i>Tringa melanoleuca</i>	Fairly common to locally common winter visitor; rare in summer
Lesser Yellowlegs	<i>Tringa flavipes</i>	Very rare to rare in winter; uncommon to fairly common fall transient
<u>Sandpipers (onshore)</u>	<i>Family: Scolopacidae</i>	
Solitary Sandpiper	<i>Tringa solitaria</i>	Very rare to casual in spring; rare but regular fall transient
Willet	<i>Catoptrophorus semipalmatus</i>	Winter visitor; fairly common in spring/summer
Wandering Tattler	<i>Heteroscelus incanus</i>	Winter visitor; casual in spring/summer
Spotted Sandpiper	<i>Actitis macularia</i>	Winter visitor; rare summer resident
Little Curlew	<i>Numenius minutus</i>	Casual vagrant
Whimbrel	<i>Numenius phaeopus</i>	Fairly common to locally common winter visitor
Long-billed Curlew	<i>Numenius americanus</i>	Winter visitor; uncommon in spring/summer
Marbled Godwit	<i>Limosa fedoa</i>	Winter visitor; uncommon to rare in spring/summer
Ruddy Turnstone	<i>Arenaria interpres</i>	Winter visitor; very rare in summer
Black Turnstone	<i>Arenaria melanocephala</i>	Winter visitor; very rare in summer
Surfbird	<i>Aphriza virgata</i>	Casual in winter; fairly common transient in spring; very rare in fall
Red Knot	<i>Calidris canutus</i>	Casual winter and summer transient
Sanderling	<i>Calidris alba</i>	Winter visitor; uncommon and local in summer

Table C-4, Page 4 of 7

**Table C-4
Seabirds Associated with the CINMS (Continued)**

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
Semipalmated Sandpiper	<i>Calidris pusilla</i>	Casual spring transient
Western Sandpiper	<i>Calidris mauri</i>	Common to uncommon but local in winter; very rare in summer
Least Sandpiper	<i>Calidris minutilla</i>	Winter visitor; casual in summer
Baird's Sandpiper	<i>Calidris bairdii</i>	Casual in spring; very uncommon fall transient
Pectoral Sandpiper	<i>Calidris melanotos</i>	Casual in spring; locally uncommon fall transient
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	Very rare fall transient
Dunlin	<i>Calidris alpina</i>	Winter visitor; uncommon spring transient; fairly common to locally common fall transient
Stilt Sandpiper	<i>Calidris himantopus</i>	Casual in spring; very rare fall transient
Buff-breasted Sandpiper	<i>Tryngites subruficollis</i>	Casual fall vagrant
Ruff	<i>Philomachus pugnax</i>	Winter visitor; very rare fall transient
Short-billed Dowitcher	<i>Limnodromus griseus</i>	Very rare winter/spring transient
Long-billed Dowitcher	<i>Limnodromus scolopaceus</i>	Winter visitor; casual in summer
Common Snipe	<i>Gallinago gallinago</i>	Winter visitor
<u>Phalaropes (onshore)</u>	<i>Family: Scolopacidae</i>	
Wilson's Phalarope	<i>Phalaropus tricolor</i>	Uncommon to fairly common spring transient; fairly common to common fall transient
Red-necked Phalarope	<i>Phalaropus lobatus</i>	Common to locally abundant spring transient; rare in summer; common fall transient
Red Phalarope	<i>Phalaropus fulicaria</i>	Absent to fairly common winter visitor; rare to abundant in spring; very rare in summer; uncommon to common in fall
<u>Jaegers (offshore)</u>	<i>Family: Laridae</i>	
Pomarine Jaeger	<i>Stercorarius pomarinus</i>	Uncommon in winter, casual in summer
Parasitic Jaeger	<i>Stercorarius parasiticus</i>	Rare but regular winter visitor, casual in summer
Long-tailed Jaeger	<i>Stercorarius longicaudus</i>	Uncommon to rare fall transient
<u>Skuas (offshore)</u>	<i>Family: Laridae</i>	
South Polar Skua	<i>Catharacta maccormicki</i>	Rare spring/fall visitor well offshore; casual in summer

Table C-4, Page 5 of 7

**Table C-4
Seabirds Associated with the CINMS (Continued)**

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
<u>Gulls (onshore and offshore)</u>	<i>Family: Laridae</i>	
Laughing Gull	<i>Larus atricilla</i>	Casual vagrant
Franklin's Gull	<i>Larus pipixcan</i>	Casual in winter/summer; very rare transient in spring/fall
Little Gull	<i>Larus minutus</i>	Casual vagrant
Common Black-headed Gull	<i>Larus ridibundus</i>	Casual vagrant in fall/winter
Bonaparte's Gull	<i>Larus philadelphia</i>	Winter visitor; rare in summer
Heermann's Gull	<i>Larus heermanni</i>	Common winter visitor; uncommon spring visitor
Mew Gull	<i>Larus canus</i>	Locally common winter visitor; casual in summer
Ring-billed Gull	<i>Larus delawarensis</i>	Common winter visitor; fairly common in summer
California Gull	<i>Larus californicus</i>	Common winter visitor; fairly common to locally common in summer
Herring Gull	<i>Larus argentatus</i>	Very uncommon to locally fairly common in winter; casual in summer
Thayer's Gull	<i>Larus thayeri</i>	Rare to locally winter visitor
Western Gull	<i>Larus occidentalis</i>	Common resident year round. Breeds along along North Coast and Channel Islands
Glaucous-winged Gull	<i>Larus glaucescens</i>	Uncommon to fairly common winter visitor; rare but somewhat regular in spring/summer
Glaucous Gull	<i>Larus hyperboreus</i>	Very rare winter visitor
Black-legged Kittiwake	<i>Rissa tridactyla</i>	Irregular winter visitor; offshore transient in spring
Sabine's Gull	<i>Xema sabini</i>	Uncommon spring/fall transient; casual in summer
<u>Terns (onshore and offshore)</u>	<i>Family: Laridae</i>	
Gull-billed Tern	<i>Sterna nilotica</i>	Casual visitor
Caspian Tern	<i>Sterna caspia</i>	Very rare to rare in winter; fairly common summer visitor
Royal Tern	<i>Sterna maxima</i>	Fairly common winter visitor; uncommon in spring; casual in summer; fairly common transient in fall
Elegant Tern	<i>Sterna elegans</i>	Casual in winter; rare in spring; common in summer/fall
Common Tern	<i>Sterna hirundo</i>	One winter record; rare summer visitor

Table C-4, Page 6 of 7

**Table C-4
Seabirds Associated with the CINMS (Continued)**

Common Names of Bird Families and Species	Scientific Names	Presence in CINMS*
Arctic Tern	<i>Sterna paradisaea</i>	Rare in spring; uncommon fall transient well offshore
Forster's Tern	<i>Sterna forsteri</i>	Common winter visitor; common transient and uncommon to fairly common summer visitor
California Least Tern	<i>Sterna antillarum brownii</i>	Fairly common but local resident in summer
Black Tern	<i>Chlidonias niger</i>	Rare and declining
<u>Skimmers (onshore and offshore)</u>	<i>Family: Laridae</i>	
Black Skimmer	<i>Rhynchops niger</i>	Very rare visitor, increasing
<u>Alcids (onshore and offshore)</u>	<i>Family: Alcidae</i>	
Common Murre	<i>Uria aalge</i>	Uncommon to common winter transient and offshore visitor; rare in spring/summer
Pigeon Guillemot	<i>Cephus columba</i>	Casual in winter/spring/fall; common summer resident. Breeds on North Coast and Channel Islands
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Very rare visitor in winter/summer/fall; casual in spring
Xantus's Murrelet	<i>Synthliboramphus hypoleucus</i>	Very rare in winter/fall; common resident offshore in spring/summer. Breeds on Channel Islands
Craveri's Murrelet	<i>Synthliboramphus craveri</i>	Very rare summer/fall visitor offshore
Ancient Murrelet	<i>Synthlibormaphus antiquus</i>	Rare and irregular winter visitor; casual in spring/summer
Cassin's Auklet	<i>Ptychoramphus aleuticus</i>	Widespread in winter; locally common in summer. Breeds on Channel Islands
Parakeet Auklet	<i>Cyclorhynchus psittacula</i>	Casual vagrant well offshore
Rhinoceros Auklet	<i>Cerorhinca monocerata</i>	Fairly common to common transient and visitor. Breeds at Point Arguello
Tufted Puffin	<i>Fratercula cirrhata</i>	Very rare visitor well offshore in winter, spring, and fall, breeding records from the islands.
Horned Puffin	<i>Fratercula corniculata</i>	Casual spring visitor well offshore

Table C-4, Page 7 of 7

Notes: *Common to Abundant:* 15 or more individuals per day in the proper habitat; *Uncommon to Fairly Common:* 1-15 individuals per day in the proper habitat; *Rare or Infrequent:* 1-15 individuals per season in the proper habitat; *Very Rare or Very Infrequent:* average of fewer than 1 record per season; *Casual:* 2-10 records total for Santa Barbara County; *Accidental:* 1 record for Santa Barbara County.

Source: The Birds of Santa Barbara County, California by Paul E. Lehman (1994, Vertebrate Museum, University of California, Santa Barbara)

**Table C-5
Seabird Species Breeding in the CINMS**

Common Name	Scientific Name
Western Grebe	<i>Aechmophorus occidentalis</i>
Clark's Grebe	<i>Aechmophorus clarkii</i>
Ashy Storm-Petrel	<i>Oceanodroma homochroa</i>
Black Storm-Petrel	<i>O. melania</i>
Leach's Storm-Petrel	<i>O. leucorhoa</i>
California Brown Pelican	<i>Pelecanus occidentalis californicus</i>
Double-crested Cormorant	<i>Phalacrocorax auritus</i>
Brandt's Cormorant	<i>P. penicillatus</i>
Pelagic Cormorant	<i>P. pelagicus</i>
Great Blue Heron	<i>Ardea herodias</i>
Snowy Plover	<i>Charadrius alexandrinus</i>
Killdeer	<i>Charadrius vociferus</i>
Black Oystercatcher	<i>Haematopus bachmani</i>
Western Gull	<i>Larus occidentalis</i>
Pigeon Guillemot	<i>Cephus columba</i>
Xantus's Murrelet	<i>Synthliboramphus hypoleuca</i>
Cassin's Auklet	<i>Ptychoramphus aleuticus</i>
Rhinoceros Auklet	<i>Cerorhinca monocerata</i>
Tufted Puffin	<i>Fratercula cirrhata</i>

Source: CDFG 2002.

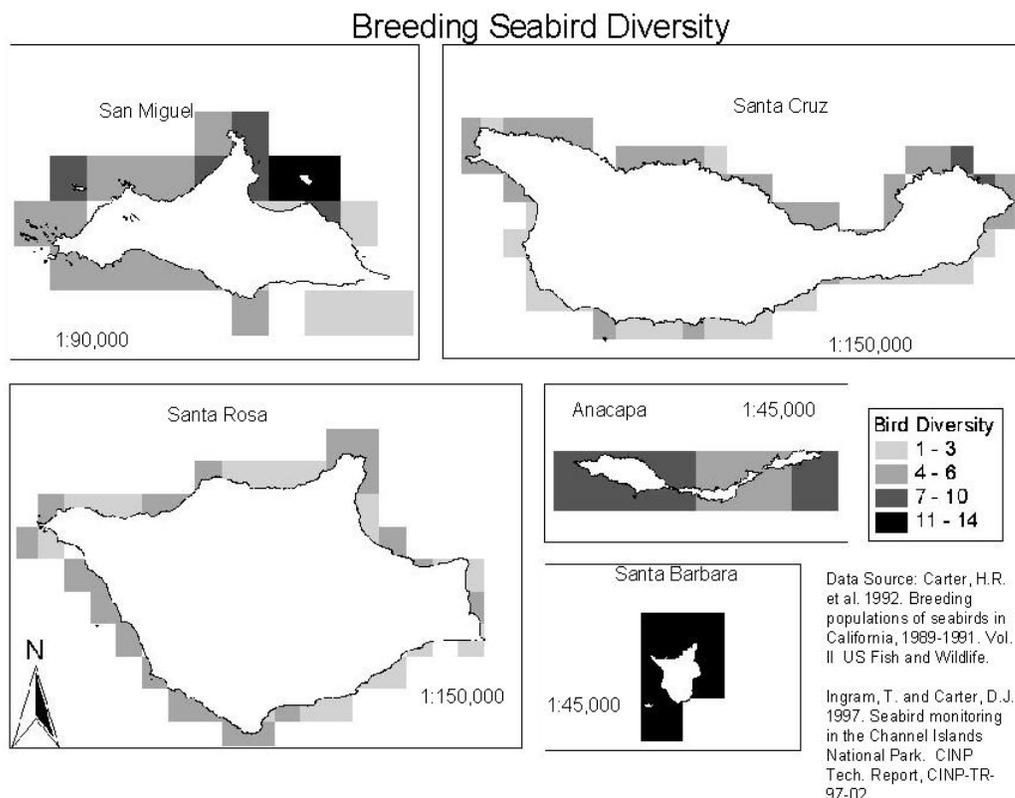


Figure C-4 Distribution of Breeding Seabird Diversity in the CINMS

Seabird occurrence in the open ocean (more than 1 kilometer offshore) is correlated to with currents and submarine topography. Water temperature affects seabird abundance as it affects upwelling. Near the Channel Islands region, upwelling occurs regularly in the waters off Point Conception, Arguello Canyon, and along the Santa Rosa-Cortez Ridge (Lehman 1994). In addition, certain seabirds frequent waters that have a specific range of temperatures. This is correlated to rare or one-time sightings of sub-tropical seabirds from the south when water temperatures become abnormally warm, and of cold-water seabirds from the north when waters become abnormally cool. Kittiwakes and fulmars have been observed in late winter and early spring when waters reach minimum temperature (Lehman 1994). Seabirds range over the open ocean, nearshore waters, bays, harbors, and rocky beaches.

Birds depend on healthy coastal and marine habitats in the CINMS. Seabirds feed and roost in many of the coastal areas of the northern Channel Islands. Sandy beaches provide foraging and resting habitat for a number of seabirds including black-bellied plover, willet, whimbrel, long-billed curlew, gulls, and sanderlings. Birds depend on the spatial transitional areas that exist between the subtidal, intertidal and upland areas for feeding and reproduction. The upland portions of the beach provide kelp deposits that attract invertebrates where black and ruddy turnstones, dowitchers, and other seabird species forage.

1.2.5.1 Special-Status Bird Species

Several bird species within the CINMS have special status under federal or State law (Table C-6). In addition, most seabirds are protected by the Migratory Bird Treaty Act. For several species listed as threatened or endangered, the northern Channel Islands represent designated critical habitat areas. Birds depend on a healthy coastal marine environment for survival, and feed near shore on small fishes associated with the CINMS. Additional descriptive information on many of these species is presented below.

Table C-6
Birds with Special Status Under Federal or California State Law Commonly Found in the CINMS

Common Name	Scientific Name	Status*
Ashy storm-petrel	<i>Oceanodroma homochroa</i>	California Species of Concern (CSC), Department of Fish and Game
Black storm-petrel	<i>Oceanodroma melania</i>	CSC
California brown pelican	<i>Pelecanus occidentalis californicus</i>	Federally Endangered, State Endangered, State Fully Protected Species
California least tern	<i>Sterna antillarum browni</i>	Federally Endangered, State Endangered, State Fully Protected Species
Double-crested cormorant	<i>Phalacrocorax auritus</i>	CSC
Rhinoceros auklet	<i>Cerorhinca monocerata</i>	CSD
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	Federally Threatened, CSC
Xantus' murrelet	<i>Synthliboramphus hypoleucus</i>	CSC

Source: CDFG 2002.

Leach's storm petrel is fairly common along the Pacific coast, uncommon south of breeding range along Atlantic coast, and has a highly restricted breeding range. It inhabits coastal islands and open sea. In the Channel Islands, Leach's storm-petrels bred on Santa Barbara and San Miguel Islands (Lehman 1994). It is nocturnal in its breeding activities and nests in colonies found on coastal islands, such as those within the region. During the day, they nest in horizontal burrows that can be up to 1 meter long or are at sea foraging for food. This species feeds by hovering just above the water and swooping down to catch plankton, small fish, and squid (Ehrlich *et al.* 1988). One egg is laid anytime from early June to late July, and the incubation lasts 40 to 50 days, during which time both parents tend the egg. Winters are spent at sea, possibly in the tropics. (Nova Scotia Museum of Natural History 2000)

Ashy storm-petrel (Oceanodroma homochroa)

Ashy storm-petrels are small, highly pelagic, seabirds that prey on small invertebrates (young squid, euphausiids, crab larvae) and small fish while they flutter along at the ocean's surface. Ashy storm-petrels are restricted to the north-east Pacific Ocean, breeding on islands from central to southern California (with a few small colonies in Baja California and northern California). Approximately one-half of the world population, estimated at less than 10,000 individuals, nest at the Farallon Islands and half in the Channel Islands, primarily at San Miguel, Santa Barbara, and Santa Cruz islands (Carter *et al.*

1992). The breeding period is from April through November, although birds may visit their nesting colonies year-round. Dispersal in the non-breeding season is thought to be limited. Large numbers congregate each fall in Monterey Bay. Populations of ashly storm-petrels have declined by an estimated 34 percent over the past 20 years at the Farallon Islands (Sydeman *et al.* 1998a,b) (long-term trends are not available for the Channel Islands population). Factors in the decline include habitat loss from invasive non-native plants; introduction of feral cats, house mice, and other nonnative animals; decline in zooplankton in the SCB; and predation by house mice, western gulls, burrowing owls, and other owl species (Sydeman *et al.* 1998; Nur *et al.* 1999). Ashly storm-petrels are also known to be sensitive to human disturbance, oil pollution, and marine pollution.

Black storm-petrel (Oceanodroma melania)

Black storm-petrels are found in the north-east Pacific Ocean. They primarily breed on islands of the coast of Baja California and in the Gulf of California (Harrison 1983). A small population, estimated at 274 individuals, breeds from April to October on Santa Barbara Island in Santa Barbara County (Carter *et al.* 1992). After breeding, birds generally move south towards northern South America, however, in warm-water years large numbers move as far north as Monterey and Point Reyes (Harrison 1983).

California brown pelican (Pelecanus occidentalis californicus)

The California brown pelican was listed as an endangered species under the ESA in 1970 and by the Commission in 1971 because of decreased population numbers and extensive reproductive failures. These resulted from the effects of DDT and other chlorinated hydrocarbons in the late 1960s. In addition, they are a fully protected species under Fish and Game Code Section 3511. California brown pelicans are found in estuarine, marine subtidal, and pelagic waters along the California coast. California brown pelicans breed in the SCB at West Anacapa Island, Ventura County, and Santa Barbara Island, Santa Barbara County, in the Channel Islands and several islands off Baja California, Mexico. During the non-breeding season birds disperse along the coast, as far north as Vancouver, British Columbia and south to El Salvador.

California brown pelicans are colonial nesters and require nesting grounds free from human disturbance and mammalian predators, and must be in proximity to adequate food supplies (Gress and Anderson 1983). Nest sites are located on steep, rocky slopes and bluff edges and are comprised of sticks or debris. Communal roost sites are essential habitat for California brown pelicans (Gress and Anderson 1983) because, unlike other seabirds, California brown pelicans have wettable plumage (Rijke 1970) which can become heavy and hypothermic in cold water if they do not come ashore regularly to dry and recondition their plumage. Roost site selection is based on minimal disturbances and microclimate features that aid in thermoregulation. California brown pelicans congregate in traditional high quality roosts at night with major night roosts supporting hundreds to thousands of pelicans (Briggs *et al.* 1987). Substantial numbers (averaging in the thousands) roost on South Farallon Island and feed in the surrounding waters during the fall and winter.

California brown pelicans are diving birds that feed almost exclusively on fish and dive from 6 to 12 meters (6.6–13.2 feet) in the air (Johnsgard 1993). The main prey items in California are northern anchovies, Pacific sardines, and Pacific mackerel. After the collapse of the sardine fishery in the 1950s, northern anchovies were found to comprise 92 percent of the diet of California brown pelicans nesting in the SCB (Gress *et al.* 1980; Gress and Anderson 1983). In recent years however, Pacific sardine populations have been increasing and may now be common items in the California brown pelican diet.

Double-crested cormorant (Phalacrocorax auritus)

The double-crested cormorant is a California species of special concern. The double-crested cormorant is 26 to 32 inches in length. Adult plumage is black with iridescent green and purple above. The unfeathered throat pouch is yellow-orange, and the bill and feet are black. Juveniles are pale brown above with varying amounts of white below. The throat pouch and lower mandible are yellow and sometimes the upper mandible is yellow as well. The iris is brown in juveniles and blue-green in breeding adults. This species has a long tail and flies with a distinctive crook in its neck (Audubon 1988).

This migratory breeding seabird is a highly adaptive colonial breeder that utilizes a variety of habitats and is found both on the coast and inland. Breeding locations may change from year to year. This species breeds in the Aleutian Islands, Alaska and southwards along the Pacific coast, to Baja California, Mexico. This species breeds on Santa Barbara, Anacapa and San Miguel Islands (Lehman 1994). Double-crested cormorants feed on schooling fish, aquatic invertebrates, and, rarely, small invertebrates. This species uses wetland to open water habitats, and nests along seacoasts, on coastal cliffs and around rivers, marshes, and lakes. The birds build a platform nest of sticks, seaweed and other materials on the ground or in trees (Ehrlich *et al.* 1992).

Rhinoceros auklet (Cerorhina monocerata)

The rhinoceros auklet is a California species of special concern. This species is approximately 15 inches in length with plumage that is sooty brown above and a grayish-brown throat, breast, sides, and flanks. Two stripes of white plumes run backward across the face; one from the base of the bill below the eye, and one just above and behind the eye. The bill is reddish-orange with a pale knob at the base of the lower mandible. In winter, the facial stripes and knob on the bill are absent. Juveniles are darker in color, with a smaller, darker bill similar to the winter plumage adult (Audubon 1988).

The rhinoceros auklet is a pelagic migratory breeding seabird common along most of the West Coast in fall and winter. It breeds colonially in burrows in maritime and inland grassy slopes, occasionally on flat ground on forest floors, usually with other alcids, in areas from the western Sea of Okhotsk, Sakhalin, and the southern Kuril Islands south of Japan and northeast Korea. They also breed from the Aleutians east to southern Alaska, south through British Columbia and Washington to California. This species is often seen in large numbers close inshore and feeds on mostly small fish and some squid. Rhinoceros auklets breed on several of the Channel Islands (Lehman 1994).

California Least Tern (Sterna antillarum browni)

The California least tern is Federally and California State-listed as endangered. The California least tern is approximately 8 and a half to 9 and a half inches in length. In breeding plumage, adults have a broad white forehead framed by a black crown and a black line running from the crown through the eye to the base of the bill. The mantle and short, strongly forked tail are pearl gray. A long, thin wedge of black up the leading edge of the outer wing, formed by the two outermost primary feathers and coverlets, is conspicuous in flight. Both the narrow black-tipped bill and the feet are yellow. Winter adults retain the black head pattern, which is blurred by a mixture of black and white feathers. Juveniles have a largely white head with a black line through the eye and a black nape. The entire leading edge of the wing is dark. The bill is black and the legs are brown (Audubon 1988).

California least terns feed on fish, such as top smelt, and aquatic invertebrates. The California least tern is 1 of 12 recognized subspecies of the least tern, 3 of which inhabit the United States. The breeding range of this subspecies extends along the Pacific coast from San Francisco Bay, California, to Bahia de

San Quintin, Baja California, Mexico. The California least tern is a migratory species that arrives in California by late April to breed and departs to unknown southerly locations by August. It nests in colonies on coastal, sandy, open areas, usually around bays, estuaries, and creek and river mouths. Nests are unlined open scrapes or depressions in the sand on open, flat beaches that the birds often adorn with small fragments of shell or pebbles. During the average 21-day incubation period, the nest is tended continually by both parents. The adults tend flightless, but quite mobile, chicks for approximately three weeks after hatching. After fledging, the young California least terns do not become fully proficient at capturing fish until after they migrate from the breeding grounds. Adults and fledglings usually leave the breeding colony within about ten days of fledging (Ehrlich *et al.* 1989).

Western Snowy Plover (Charadrius alexandrinus)

The Pacific coast population of the western snowy plover was Federally listed as threatened on March 5, 1993. A recovery plan is currently being prepared. The final rule listing the western snowy plover as threatened describes its biology and reasons for its decline (58 *Federal Register* 42: 12864). Critical habitat was designated for the western snowy plover and includes all suitable habitat from Point Sal to Point Conception including Vandenberg AFB, the Santa Ynez River mouth, and Jalama Beach; Santa Barbara coast beaches including Devereux Beach (Coal Oil Point), Santa Barbara Harbor Beach, and Carpinteria Beach; Oxnard lowlands beaches including San Buenaventura Beach, Mandalay Bay/Santa Clara River mouth, Ormond Beach, and Mugu Lagoon; and the Channel Islands including San Nicolas Island beaches (65 *Federal Register* 64:68508). In addition, the coastal population of the western snowy plover is a California Species of Special Concern, and on the Audubon Society's Watch List.

The western snowy plover has gray-brown upper parts, a conspicuous patch on either side of the breast, a white eyebrow extending back from the forehead, a long thin black bill, and slate-colored legs. Adults have dark ear coverlets and breast patches, are blackish in breeding plumage, and gray-brown in winter. Breeding birds have a black bar across the forecrown as well. Juveniles have paler ear coverlets and breast patches are the same colors as the upper parts (Audubon 1988).

Western snowy plovers are migratory breeding shorebirds that forage on invertebrates in intertidal zones, the wrack line, dry sandy areas above the high tide line, salt pans, and the edges of salt marshes. They feed by quickly running, stopping to pick up food or probe the surf line. Western snowy plovers eat marine worms, small crustaceans, and at inland locations, eat insects. The Pacific coast population nests near tidal waters along the mainland coast and offshore islands from southern Washington to southern Baja California, Mexico. Most nesting occurs on unvegetated to moderately vegetated, dune-backed beaches and sand spits. Other less common nesting habitats include salt pans, dredged soils, and salt pond levees. Nest site fidelity is common. Nesting and chick rearing activity generally occur between March 1 and September 30. During the non-breeding season, western snowy plovers may remain at breeding sites or may migrate to other locations, with most wintering south of Bodega Bay, California. Many birds from the interior population winter on the central and southern coast of California.

Xantus's murrelet (Synthliboramphus hypoleucus)

Xantus's murrelets are considered an California species of special concern and are a globally rare seabird species (one of the ten rarest seabird species in the North Pacific). Petitions have been made to list this species under both the Federal and State ESA, due to its small population size and limited breeding range, as well as declining world population size (estimated as less than 10,000 birds) and known threats to colonies. Xantus's murrelets are small birds that feed on larval fish including northern anchovies, sardines, rockfish, Pacific sauries, and crustaceans, and forage in the immediate vicinity of the colony during the nesting season (Hunt *et al.* 1979). The world population of Xantus's murrelet only breeds from the Channel Islands south to Central Baja California, Mexico. Eighty percent of the United States

breeding population and 33.5 percent of the world's breeding population nest in the Channel Islands, primarily at Santa Barbara Island (also found at San Miguel, Santa Cruz, and Anacapa islands). They return to the nesting islands in February and disperse from the islands by mid-July. They nest in rock crevices along steep cliff edges, under bushes, on the ground in vegetation, in burrows, under debris piles, and under human made structures. Daylight hours are spent on nests or foraging at sea, whereas nest site selection, incubation shift changes, and fledging all occur under cover of night (Hunt *et al.* 1979). Chicks depart to the sea with their parents at night at 2 days of age and are dependent on their parents for an extended period of time (Gaston and Jones 1998). Chicks that get lost or separated from their parents at night, or those who leave the nest during the day, are often fed upon by predators (e.g., western gulls).

1.2.6 Sea Turtles

Four species of sea turtles have been reported in the offshore southern California region. Three of these are members of the family Cheloniidae while one is the only living member of the family Dermochelyidae. The cheloniids include the green sea turtle (*Chelonia mydas*), the loggerhead sea turtle (*Caretta caretta*), and the olive-Ridley sea turtle (*Lepidochelys olivacea*). The only dermochelyid is the leatherback sea turtle (*Dermochelys coriacea*) (National Marine Fisheries Service [NMFS] and United States Fish and Wildlife Service [USFWS] 1998a, b, c, d, e).

The leatherback sea turtle is the species most commonly seen off the coast of California and has been reported in the Pacific Ocean as far south as Chile and as far north as Alaska and the Bering Sea. In addition to offshore southern California, loggerhead sea turtles are also commonly found in the North Pacific Ocean, and travel between nesting beaches in Japan and north of Hawaii. The normal range of the remaining species does not extend north of Baja California, but individuals have been sighted or caught farther north (NMFS and USFWS 1998d).

None of the four sea turtles species are known to nest on the west coast of the United States. With all four species, sporadic sightings of turtles have been made within United States waters. Migratory routes of sea turtles have been increasingly studied in last 5-6 years and new information is emerging (NMFS 2004). However, much remains unknown about migration routes and normal movements of sea turtles while at sea, research (NMFS and USFWS 1998a, b, c, d, e).

All sea turtles are protected by the ESA. Leatherback sea turtles are listed as endangered. The other three species are listed as threatened; however the nesting populations of green and olive ridley sea turtles on the Pacific coast of Mexico are listed as endangered.

All four species have been heavily impacted by human and other factors. Terrestrial threats to all four species include: directed take of turtles and/or eggs; poaching; increased human presence; coastal construction; artificial lighting; beach mining; vehicles driving on beaches; beach cleaning; beach replenishment covering eggs too deeply; predation; and beach erosion. Marine threats include: directed take of juvenile or adult turtles; poaching; environmental contaminants; debris entanglement or ingestion; incidental take by fisheries; algae, sea grass and reef degradation; collisions with boats; marina and dock development; dynamite "fishing;" oil exploration and development; entrapment in power plants; underwater blasting; predation; and disease and parasites.

Recovery plans for four of the U.S. Pacific populations of sea turtles cover the west coast of the continental United States, the state of Hawaii, and all of the Pacific islands under U.S. jurisdiction, which extend as far west as Guam. There are two recovery plans for the green turtle, one for the eastern Pacific green turtle, and one for the central and western Pacific green turtle. Recovery plans include determining

population status in U.S. waters and supporting censuses in other countries within the range of the four species of sea turtles.

With all four species, sporadic sightings of turtles within U.S. waters have been made. In addition, some information is available regarding incidental take by American net fisheries. Additional data are available from NMFS observers stationed aboard tuna purse seine boats in the eastern tropical Pacific. Stranding information is also available for the west coast and Alaska. More data are available from nesting beaches and limited catch records in other countries. A list of sea turtles present in CINMS is presented in Table C-7.

Table C-7
Testudines: Sea Turtles in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Green sea turtle (<i>Chelonia mydas</i>)	Not available	Threatened and Endangered under ESA	Rare	Warm water months	Coastal to pelagic
Olive ridley sea turtle (<i>Lepidochelys olivacea</i>)	Not available	Threatened and Endangered under ESA	Rare	Warm water months	Coastal to pelagic
Loggerhead sea turtle (<i>Caretta caretta</i>)	Not available	Threatened under ESA	Rare	Warm water months	
Leatherback sea turtle (<i>Dermochelys coriacea</i>)	Not available	Endangered under ESA	Uncommon	Warm water months	Pelagic

Source: NMFS and USFWS 1998a, b, c, d, e.

Green sea turtle (Chelonia mydas)

The eastern Pacific green sea turtle is listed as threatened and endangered throughout its entire range under the ESA. The population has suffered a severe decline over the past 30 years. Between 1950 and 1970, the decline began when wintering green sea turtles in the Gulf of California were vastly over-harvested. The decline continued from 1960 through 1980 with egg harvests on the mainland coast of Mexico (NMFS and USFWS 1998a).

The normal range of the eastern Pacific green sea turtle is from Baja California to Peru and out to the Galapagos Islands. Green sea turtles have been reported as far north as British Columbia, and in 1993, a green sea turtle stranded at Homer Alaska. In 1996, another was recovered from Prince William Sound, Alaska (NMFS and USFWS 1998a).

Green turtles appear to prefer waters with temperatures above 18 - 20 Celsius. Green turtles in these areas are likely foraging in shallow waters or at shallow depths, or transiting to foraging grounds. During warm spells (e.g., El Niño), green turtles may be found considerably north of their normal distribution (NMFS 2004).

One resident population of green sea turtles exists in San Diego Bay (Dutton and McDonald 1990a, b and 1992; McDonald *et al.* 1994; Stinson 1982). About 30 juvenile and adult animals have congregated near the warm water discharge from the San Diego Gas and Electric Company Power Plant. This population is an anomaly.

Green sea turtles are mostly herbivores, but they also eat sardines and anchovies, jellyfish, mollusks, and even worms, among other things (NMFS and USFWS 1998a).

Olive ridley sea turtle (Lepidochelys olivacea)

The olive ridley has been regarded as the most abundant sea turtle in the world. Before it was exploited, Clifton *et al.* (1982) estimated that the population off the Pacific coast of Mexico numbered over 10,000,000 animals. Yet in just 1968, over 1,000,000 olive ridleys were caught in Mexico (Carr 1972). The population in Mexico is now listed as endangered because of gross over-harvesting. The rest of the eastern Pacific population is considered threatened. The usual range of the eastern Pacific olive ridley is from Baja California to Peru, usually within 1200 nautical miles of shore (NMFS and USFWS 1998a).

Satellite monitoring of post nesting movements showed migration routes traversing thousands of kilometers over deep (>1000 m) oceanic water, distributed over a very broad range, suggesting that olive ridleys are nomadic and exploit multiple feeding areas, rather than migrate to one specific foraging area (NMFS and USFWS, 1998d).

In 1983, an olive ridley was captured in Los Angeles Harbor and brought to Sea World of San Diego. In 1996, an olive ridley stranded at Goleta beach State Park, near Santa Barbara and within the study area. It was cared for some months by the Santa Barbara Marine Mammal Center, then shipped to a turtle research facility in Hawaii (NMFS 2003).

Olive ridleys reportedly prey on benthic fish, mollusks, crustaceans, tunicates and algae. Pelagic prey includes jellyfish, salps and pelagic red crabs (*Pleuroncodes planipes*), which in some parts of their range may be a dietary mainstay (NMFS and USFWS 1998b).

Loggerhead sea turtle (Caretta caretta)

The loggerhead sea turtle is listed as threatened throughout its range. In the eastern Pacific, it is rare, although it has been reported as far north as Alaska and as far south as Chile. Most sightings in the eastern Pacific have been made near Baja California, and the greatest concentrations have been off Bahia Magdalena. Strandings and sightings along the west coast have mainly been in Southern California, although a few sightings were reported off Washington (NMFS and USFWS 1998c).

Based on oceanographic conditions, the loggerheads are associated with fronts, eddies, and geostrophic currents. Loggerheads also appear to utilize surface convergent forage habitat to capture their primary prey organisms which float along currents and congregate at fronts (NMFS 2004).

Loggerheads appear to prey on benthic invertebrates, but fish and plants are also eaten. Juveniles off Baja California apparently feast on pelagic red crabs (NMFS and USFWS 1998c).

Leatherback sea turtle (Dermochelys coriacea)

The leatherback sea turtle is considered endangered throughout its range. In the eastern Pacific, the range extends mainly along the slope from Chile to Alaska. The leatherback is the most commonly seen sea

turtle off the California coast. For example, from 1986 to 1991, 96 sightings were reported off Monterey Bay alone. Also, leatherback sea turtle strandings account for 50 of 104 sea turtle strandings on the west coast between 1982 and 1991.

Leatherback sea turtles once nested in tremendous numbers on the west coast of Mexico. Nearly half of the world's population of female leatherbacks nested there. Tragically, this population has noticeably declined in recent years. Eggs as well as adult females have been harvested in large numbers.

Leatherback sea turtles are highly migratory, exploiting convergence zones and upwelling areas in the open ocean, along continental margins, and in archipelagic waters (Morreale, *et al.*, 1994; Eckert, 1998; Eckert, 1999a). Recent information on leatherback sea turtles tagged off the west coast of the United States has revealed an important migratory corridor from central California, to south of the Hawaiian islands, leading to western Pacific nesting beaches (P. Dutton, NOAA Fisheries, personal communication, December 2003).

Leatherbacks consume mostly cnidarians (medusas and siphonophores) and tunicates (salps and pyrosomas); in lay terms, jellies (NMFS and USFWS 1998d).

1.2.7 Marine Mammals

The Channel Islands and surrounding waters support a great diversity of marine mammals. The marine mammals discussed in this section represent three orders: Cetacea--whales dolphins and porpoises; Pinnipedia--seals, sea lions and fur seals; and Carnivora, which in this case is represented only by the southern sea otter (*Enhydra lutris nereis*), a member of the family Mustelidae. Cetaceans live their entire lives at sea, while pinnipeds come ashore periodically to rest, breed, bear young, or molt. In California, sea otters normally spend their entire lives at sea, though some do haul out on land, whereas in Alaska, they often haul out (Vandever 1972; Miller 1974).

All pinnipeds and cetaceans are protected under the Marine Mammal Protection Act of 1972 (MMPA) and its amendments. In addition, some species are listed under the MMPA as depleted or strategic stocks. Finally, some species are listed as threatened and endangered under the Federal and State ESA.

As in the case of birds, the abundance and distribution of marine mammals is an important indication of the general health and ecological integrity of the marine ecosystems of the CINMS. Marine mammals feed on fishes and invertebrates, which feed on other marine life of the northern Channel Islands. In general, the distribution and abundance of mammals, fishes and other marine life depend on healthy marine habitats, such as kelp forests and associated rocky reef ecosystems. For example, sea lions depend directly on fish and invertebrate prey, which then in turn depend on linkages with lower trophic levels.

Mammals, in turn, are important to healthy marine ecosystems because, for example, they distribute important nutrients and foods throughout the marine environment that other marine life depend on for survival. Pinnipeds depend on haulout and rookery sites throughout the Channel Islands (Figure C-5). This section describes the species of marine mammals known to occur in the Channel Islands, including population status, protected status, regional distribution, and seasonality of each species.

Marine Mammal Diversity

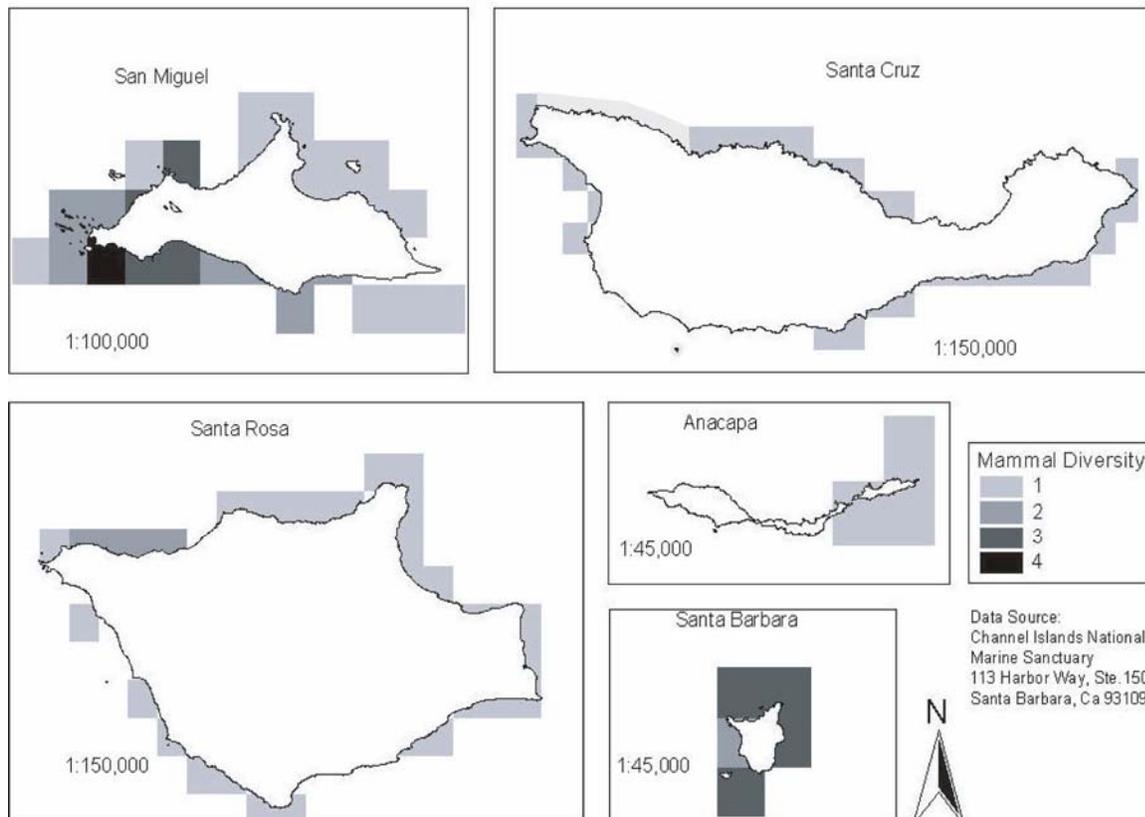


Figure C-5 Distribution of the Number of Marine-Mammal Species Found in Haul-Out and Rookery Sites in the CINMS

1.2.7.1 Cetaceans

At least 33 species of cetaceans have been reported in the region (Leatherwood *et al.* 1982; Leatherwood *et al.* 1987). Most of the reports involve live sightings although a few are known only from strandings. The toothed whales, or odontocetes, number 25 species. Only eight species of baleen whales, or mysticetes, have been reported. Two of these are in their own families. The northern right whale (*Eubalaena glacialis*) is the only representative of the family Balaenidae that has been reported in the CINMS. The California gray whale (*Eschrichtius robustus*) is the sole surviving representative of the family Eschrichtiidae. The other six species are all members of the family Balaenopteridae, more often simply called rorquals.

Of the odontocetes, seven species are commonly seen, either seasonally or year-round. Common species include the long-beaked common dolphin (*Delphinus capensis*), the short-beaked common dolphin (*Delphinus delphis*), the onshore and offshore stocks of bottlenose dolphins (*Tursiops truncatus*), Risso's dolphin (*Grampus griseus*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), northern right whale dolphin (*Lissodelphis borealis*), and Dall's porpoise (*Phocoenoides dalli*). The latter two species are generally associated with colder water masses farther offshore and north and do not often range south of the California-Mexico border (Leatherwood *et al.* 1982).

Odontocetes: Oceanic dolphins

A list of oceanic dolphins present in CINMS is provided in Table C-8.

Table C-8
Cetaceans: Odontocetes—Oceanic Dolphins in the CINMS

Common Species Name (Scientific Name)	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Long-beaked common dolphin (<i>Delphinus capensis</i>)	Stock size: 32,238	Protected under MMPA	Common	Year-round	Coastal - up to 50 nautical miles offshore
Short-beaked common dolphin (<i>Delphinus delphis</i>)	Stock size: 373,573	Protected under MMPA	Common	Year-round	Up to 300 nautical miles offshore
Bottlenose dolphin (<i>Tursiops truncatus</i>) Offshore stock	Stock size: 2,956	Protected under MMPA	Common	Year-round	Shelf, slope and offshore
Bottlenose dolphin (<i>Tursiops truncatus</i>) Coastal stock	Stock size: 206	Protected under MMPA	Common	Year-round	Surf zone up to 1km offshore
Pacific white-sided dolphin (<i>Lageno-rhynchus obliquidens</i>)	Stock size: 25,825	Protected under MMPA	Sporadically abundant	Usually summer and fall	Shelf to farther offshore
Rough-toothed dolphin (<i>Steno bredanensis</i>)	Not available for area	Protected under MMPA	Known only from a few strandings	Warm water months	Pelagic
Striped dolphin (<i>Stenella coeruleoalba</i>)	Stock size: 20,235	Protected under MMPA		Warm water months	Pelagic
Long-snouted spinner dolphin (<i>Stenella longirostris</i>)	Not available for area	Protected under MMPA	Possible during El Niño events	Warm water months	Pelagic
Spotted dolphin (<i>Stenella attenuata</i>)	Not available for area	Protected under MMPA	Known only from strandings	Warm water months	Pelagic
Northern right whale dolphin (<i>Lissodelphis borealis</i>)	Stock size: 13, 705	Protected under MMPA	Sporadically abundant	Winter and spring	Continental shelf and slope

Table C-8, Page 1 of 2

**Table C-8
Cetaceans: Odontocetes - Oceanic Dolphins in the CINMS (Continued)**

Common Species Name (Scientific Name)	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Risso's dolphin (<i>Grampus griseus</i>)	Stock size: 16,483	Protected under MMPA	Common	Year-round	Shelf, slope and
Short-finned pilot whale (<i>Globicephala macro- rhynchus</i>)	Stock size: 970	Protected under MMPA	Uncommon	Most often summer and fall	Shelf, slope and offshore
Killer whale (<i>Orcinus orca</i>) E.N. Pacific offshore stock	Stock size: 285	Protected under MMPA	Uncommon	Year-round	Shelf, slope and offshore
Killer whale (<i>Orcinus orca</i>) E.N. Pacific transient stock	Stock size: 346	Protected under MMPA	Uncommon	Year-round	
False killer whale (<i>Pseudorca cressidens</i>)	Not available for region	Protected under MMPA	Rare	Warm water months	Shelf to offshore and pelagic

Table C-8, Page 2 of 2

Note: MMPA – Marine Mammal Protection Act of 1972 and its amendments

Source: Carretta *et al.* 2001 and 2002

Long-beaked Common Dolphin (Delphinus capensis)

Two species of common dolphins, the long-beaked and the short-beaked, are found in the eastern north Pacific (Heyning and Perrin 1994). Prior to this time, only one species was recognized, the common dolphin (*Delphinus delphis*). Some authorities recognized the long-beaked common dolphin as the "Baja neritic" form of common dolphin rather than as a separate species. This recent change in taxonomy has presented difficulties in assessing long-term population or stock changes from surveys and censuses made before the change. Some authorities simply group the two species together as *Delphinus* spp., when discussing earlier work (Carretta *et al.* 2002).

Recent estimates place the population of long-beaked common dolphins in the region at 32,239 for animals in California, Oregon, and Washington (1991–1996 average) (Carretta *et al.* 2002). This species ranges from the coast out to 50 NM offshore. It usually frequents water less than 28 degrees C. Its geographic range in the region extends from Point Sal, north of Point Conception, to the tropics. It feeds primarily on Pacific hake (*Merluccius productus*) and northern anchovy (*Engraulis mordax*). Both species reportedly feed extensively at night, following the deep scattering layer (Leatherwood *et al.* 1987) although both species have also been observed feeding during the day.

Short-beaked Common Dolphin (*Delphinus delphis*)

The short-beaked common dolphin population has been estimated at 373,573 for animals in California, Oregon, and Washington (1991–1996 average) (Carretta *et al.* 2002). This species is more widespread in distribution than the long-beaked common dolphin, ranging up to 300 NM offshore. It feeds on Pacific hake, northern anchovy and market squid (*Loligo opalescens*) (Leatherwood *et al.* 1987).

Bottlenose Dolphin (*Tursiops truncatus*)

Two stocks of bottlenose dolphins have been distinguished: the California coastal stock and the California-Oregon-Washington offshore stock. The coastal stock ranges from literally in the surf out to approximately 1 kilometer offshore (Carretta *et al.* 2002). During the 1982 to 1983 El Niño event, coastal bottlenose dolphins ventured into central California. They have been reported as far north as San Francisco. Their usual northern limit was once Los Angeles County. Since that time, bottlenose dolphins have remained in the coastal waters of Santa Barbara and San Luis Obispo counties. The southern limit of their range extends at least to Ensenada, Baja California Norte. Despite the extent of their range, the coastal stock is very small, with a mean estimate of only 206 animals (Carretta *et al.* 2002). Coastal bottlenose dolphins feed on fish near the bottom (Leatherwood *et al.* 1987).

In the general region, the offshore stock of bottlenose dolphins frequents the waters off Santa Catalina, San Clemente, and Santa Barbara islands (Carretta *et al.* 2002) as well as the Santa Cruz Basin, which is south of Santa Cruz Island. The offshore stock occasionally ventures into the Santa Barbara Channel, usually in summer. The overall range extends from Mexico to northern California although bottlenose dolphins have been reported off the coasts of Oregon and Washington during influxes of warm water masses to the north.

The overall California-Oregon-Washington stock size is estimated at 956 animals (Carretta *et al.* 2002). The offshore stock feeds on squid as well as fish (Leatherwood *et al.* 1987).

Pacific White-sided Dolphin (*Lagenorhynchus obliquidens*)

Two forms of Pacific white-sided dolphins have been identified from genetic analyses: a northern form, which usually ranges from Point Conception to Washington and well offshore; and a southern form, which generally ranges from Point Conception to Mexico. Both forms have been found in the SCB, but whether this represents the two forms occupying this area at different times of the year or the two forms intermixing is unknown. Unfortunately, the two forms cannot be distinguished in the field (Carretta *et al.* 2002). At present, both stocks are managed as one.

The population of Pacific white-sided dolphins from Mexico to Washington has been estimated at 25,825 animals in California, Oregon, and Washington (Carretta *et al.* 2002). These dolphins generally frequent waters along the Continental Borderland and slope as well as farther offshore. In the Channel Islands, they are often seen with humpback whales (*Megaptera novaeangliae*), which usually appear in summer and fall. Pacific white-sided dolphins feed primarily on fish (Leatherwood *et al.* 1987).

Striped Dolphin (*Stenella coeruleoalba*)

The striped dolphin is a pelagic species; that is, it roams far offshore beyond the continental slope some 100 nm seaward of land. The California population may be part of a greater population that extends well into the north Pacific and into Mexico and Central America. The estimated abundance of animals for California, Oregon, and Washington is 20,235 (Carretta *et al.* 2002). The only reports of striped dolphins in Washington and Oregon have been of stranded specimens. The striped dolphin is widely distributed

worldwide in tropical to warm temperate waters, often mingling with groups of spotted and spinner dolphins. The best-studied population exists in the eastern tropical Pacific, where incidental takes of these dolphins by the tuna purse seine fleet have been very high (Leatherwood *et al.* 1982; Leatherwood *et al.* 1987).

Northern Right Whale Dolphin (Lissodelphis borealis)

The northern right whale dolphin is the only oceanic dolphin in the region that lacks a dorsal fin. It frequents waters along the Continental Borderland and slope. It prefers cool temperate waters, generally appearing in the region during La Niña events or in areas characterized by vigorous upwelling of colder waters, such as San Nicolas and San Miguel islands. It is most common in winter and spring when the water is colder. In summer and fall, it can range as far north as Oregon and Washington. Its southern range limit is probably northern Baja California. The California population has been estimated at 13,705 animals for California, Oregon and Washington (Carretta *et al.* 2002). Northern right whale dolphins feed on lanternfish, other mesopelagic fish, and squid (Leatherwood *et al.* 1987).

Risso's Dolphin (Grampus griseus)

Risso's dolphins are found throughout the region year-round in varying numbers. They are generally most abundant in the Santa Barbara Channel, particularly off the north shores of the four northern Channel Islands. They are often seen off the coast north of Point Conception. They are often found along the Continental Borderland, slope, and offshore. They range from at least northern Baja California to Washington. The stock size is approximately 16,483 animals in California, Oregon, and Washington (Carretta *et al.* 2002). A distinctly separate stock appears to exist in the Gulf of California and southern tip of Baja California.

Prior to the El Niño event of 1982 to 1983, Risso's dolphins were relatively uncommon in the region. Following this event, however, they were consistently seen in sizable numbers. At least one researcher has suggested that these animals may have occupied a niche vacated by short-finned pilot whales during the 1982 to 1983 El Niño event or that Risso's dolphins appeared during the El Niño event and competed so successfully that most of the pilot whales left the region (Shane 1994).

Short-finned Pilot Whale (Globicephala macrorhynchus)

As discussed above, short-finned pilot whales disappeared during the 1982 to 1983 El Niño event. Over the past few years, however, progressively more individuals have been seen in the SCB, but they have not returned in their former numbers. At present, the California, Oregon, and Washington population is estimated at 970 individuals (Carretta *et al.* 2002).

Prior to the 1982 to 1983 El Niño event, short-finned pilot whales were reportedly resident off Santa Catalina Island (Shane 1994; Dohl *et al.* 1980). They were also frequently seen in the Santa Barbara Channel, the Santa Cruz Basin, and off Santa Barbara Island. Short-finned pilot whales feed almost exclusively on squid (Leatherwood *et al.* 1987), which may lend some credence to the theory that they were displaced by Risso's dolphins, which also prey heavily on squid (Shane 1994).

Killer Whale (Orcinus orca)

Killer whales found off the California coast are currently referred to as the eastern North Pacific transient stock, the eastern North Pacific offshore stock or the eastern North Pacific resident stock (Carretta *et al.* 2002). The transient and offshore stocks travel as far north as Alaska and as far south as California. At

present, the best estimate of the eastern North Pacific transient stock is 336 animals (Carretta *et al.* 2001). The eastern North Pacific offshore stock evidently does not mix with transient and resident stocks that overlap its range. The best estimate of this stock size is 285 animals (Carretta *et al.* 2002).

A stock of resident killer whales exists in the waters of Puget Sound. Until recently, researchers believed these animals stayed in the inland waters of the sound. Some individuals from the inland stock were identified in the company of transient killer whales off the coast, however, clouding the issue of distinctive stocks. These animals have been seen as far south as Monterey Bay (Carretta *et al.* 2001).

Killer whales feed on fish and other marine mammals (Leatherwood *et al.* 1982). Around the Channel Islands, killer whales have been observed feeding on gray whales (*Eschrichtius robustus*), Pacific harbor seals (*Phoca vitulina richardsi*), and California sea lions (*Zalophus californianus c.*). They have also been observed feeding on fish.

False killer whale (Pseudorca crassidens)

False killer whales inhabit tropical to subtropical waters. Their usual northern range limit along the mainland coast is Baja California, although a few individuals have been reported in the SCB. A few stranded specimens have also been reported (Leatherwood *et al.* 1982; Leatherwood *et al.* 1987). False killer whales are rare off California, so no stock estimates have been projected.

Odontocetes: True Porpoises

A list of true porpoises in the CINMS is provided in Table C-9.

Table C-9
Cetaceans: Odontocetes—True Porpoises in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat	Water Mass Preference
Dall's Porpoise (<i>Phocoenoides dalli</i>)	Stock size: 117,545	Protected under MMPA	Uncommon	Winter and spring	Shelf to well off-shore	Subtemperate waters
Harbor Porpoise (<i>Phocoena phocoena</i>) Morro Bay stock	Stock size: 932	Protected under MMPA	Uncommon	Year-round	Point Lobos to Point Conception: Shallow coastal waters	Subtemperate waters

Source: Carretta *et al.* 2002.

Dall's Porpoise (Phocoenoides dalli)

Dall's porpoises frequent waters from the Continental Borderland to well offshore. They prefer cooler temperate waters and are seldom seen if the sea surface temperature is above about 19 degrees C (Leatherwood *et al.* 1982). They are most often seen in the SCB in winter and spring when the water is coldest. During La Niña years, they may roam as far south as northern Baja California (Carretta *et al.* 2002).

The California stock has been estimated at 117,545 animals for California, Oregon and Washington (1991-1996 average) (Carretta *et al.* 2002). Dall's porpoises are among the fastest of small cetaceans, reportedly reaching speeds of up to 22 knots. They feed on fish and cephalopods, mainly at night (Leatherwood *et al.* 1982).

Harbor Porpoise (*Phocoena phocoena*)

Several stocks of harbor porpoises are recognized, more for management purposes than because of distinct geographic boundaries. A good part of the population frequents waters from about 91 meters into very shallow water. The Morro Bay stock, which ranges from Point Lobos, in Monterey County, to Point Conception, is estimated at 932 individuals (Carretta *et al.* 2002). Harbor porpoises are rarely seen south of Point Conception. Harbor porpoises feed on benthic and schooling fish and invertebrates (Leatherwood *et al.* 1982).

Odontocetes: Sperm Whales

A list of sperm whales in the CINMS is provided in Table C-10.

Table C-10
Cetaceans: Odontocetes—Sperm Whales in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Sperm Whale (<i>Physeter macrocephalus</i>)	Stock size: 1,640	Protected, depleted, strategic under MMPA. Endangered under ESA	Rare	April to mid June and August to mid November	Deep sea
Pygmy sperm whale (<i>Kogia breviceps</i>)	Stock size: 4,746	Protected under MMPA	Uncommon	Unknown	Deep sea, pelagic
Dwarf sperm whale (<i>Kogia simus</i>)	Unknown	Protected under MMPA	Known from three strandings	Unknown	Deep sea, pelagic

Source: Carretta *et al.* 2002.

Sperm Whale (*Physeter macrocephalus*)

Sperm whales are classified as endangered under the ESA, as a strategic stock under the MMPA, and depleted under the MMPA. For management purposes, the California-Oregon-Washington population is considered one stock, even though sperm whales are distributed as far north as Alaska and the Bering Sea. The California-Oregon-Washington stock is estimated at 1,640 animals (Carretta *et al.* 2002).

Sperm whales inhabit deep ocean waters well offshore and have rarely been reported in the Santa Barbara Channel. At least two strandings of sperm whales have been reported for the northern Channel Islands. One specimen, which washed ashore at San Miguel Island, was entangled in a nylon fishing net. Sperm whales appear to be most abundant from April to mid-June and from late August to mid-November, although they have been reported year-round. At least some individuals are residents in California waters. Another resident population exists in the Gulf of California (Carretta *et al.* 2002). Sperm whales

can dive to depths of at least 3,000 meters, staying down over an hour, so they may be under-reported. They feed almost exclusively on squid (Leatherwood *et al.* 1982).

Pygmy sperm whale (Kogia breviceps)

Little is known about this whale because it inhabits deep pelagic waters, with little vessel traffic. Also, the pygmy sperm whale is quite small, reaching only up to 3.4 meters in length and is not conspicuous while on the surface. Finally, it can stay down for considerable periods.

Originally, the California population of pygmy sperm whales was estimated at 2,993. It is very difficult to distinguish between pygmy and dwarf sperm whales (please see below) at any distance, however, so sightings of such animals were simply recorded as *Kogia* sp. The number of dwarf sperm whales was derived from the total sightings of *Kogia* sp. at 1,813. However, no dwarf sperm whales have been reported since the early 1970s in California, so researchers now assume that the 1,813 animals listed as dwarf sperm whales were very likely pygmy sperm whales, bringing the total to 4,746 animals (Carretta *et al.* 2002).

At least two pygmy sperm whales have stranded within the study area. Strandings have also been reported along other parts of the California coast as well as in Oregon and Washington.

Pygmy sperm whales feed on squid, crabs and benthic fish beyond the Continental Borderland (Leatherwood *et al.* 1982)

Dwarf sperm whale (Kogia simus)

The dwarf sperm whale was recognized as a different species from the pygmy sperm whale in 1966 (Handley 1966), thus observations made before then do not differentiate between the two species. In any case, no recent observations of this species have been recorded. Only three strandings have occurred in California, all many years ago.

The dwarf sperm whale occupies the same deepwater realm as the pygmy sperm whale and feeds on the same type of organisms (Leatherwood *et al.* 2002). Because of its small size, long submergence periods and cryptic behavior while on the surface, very little is known of this species even in areas where it regularly occurs.

Odontocetes: Mesoplodont Beaked Whales

A list of mesoplodont beaked whales in the CINMS is provided in Table C-11.

Five species of beaked whales of the Genus *Mesoplodon* have been reported in the region. All are deepwater species that are cryptic in their behavior. Moreover, they remain submerged for long periods. Finally, they are virtually impossible to distinguish in the field. Most positive identifications have come from specimens killed in domestic drift nets and from stranded specimens. Considering these difficulties, all five species are treated as one unit for management purposes. Although the management stock is said to include California, Oregon and Washington, the only sightings available are from California waters (Carretta *et al.* 2002). The best estimate of nonspecific mesoplodonts is 3,738 (Carretta *et al.* 2002).

Table C-11
Cetaceans: Odontocetes—Mesoplodont Beaked Whales in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Blainville's beaked whale (<i>Mesoplodon densirostris</i>)	Stock size: 360	Protected under MMPA	Uncommon	Unknown	Deep water
Hubb's beaked whale (<i>Mesoplodon carlhubbsi</i>)	Collective stock size: 3,738	Protected under MMPA	Uncommon	Unknown	Deep water
Ginkgo-toothed whale (<i>Mesoplodon ginkgodens</i>)	Collective stock size: 3,738	Protected under MMPA	Uncommon	Unknown	Deep water
Perrin's beaked whale (<i>Mesoplodon perrini</i>)	Collective stock size: 3,738	Protected under MMPA	Uncommon	Unknown	Deep water
Stejneger's beaked whale (<i>Mesoplodon stejnegeri</i>)	Collective stock size: 3,738	Protected under MMPA	Uncommon	Unknown	Deep water

Source: Carretta *et al.* 2002.

Blainville's beaked whale (Mesoplodon densirostris)

An estimate of the California-Oregon-Washington stock of Blainville's beaked whale has been made for 360 animals (Carretta *et al.* 2003). One Blainville's beaked whale stranded in Ventura, within the study area (NOAA Fisheries 2003). Another stranded in San Mateo County, California (Leatherwood *et al.* 1982).

Hubb's beaked whale (Mesoplodon carlhubbsi)

One Hubbs' beaked whale stranded in Santa Barbara, within the study area (NOAA Fisheries 2003). Hubbs' beaked whales have stranded from San Diego, California to British Columbia, however, so it is likely that they may be found within the study area. Five Hubbs' beaked whales were observed killed in drift nets during the period 1991-1995 (Carretta *et al.* 2003).

Ginkgo-toothed whale (Mesoplodon ginkgodens)

The ginkgo-toothed beaked whale is known from two strandings: one in Baja California, the other at Del Mar, California (Leatherwood *et al.* 1982). Its presence in the study area is extremely unlikely.

Perrin's beaked whale (Mesoplodon perrini)

Perrin's beaked whale is known from several strandings in Southern California. It has also been reported twice off the Southern California Bight: once near Santa Catalina Island, the other time off San Clemente

Island (Leatherwood *et al.* 1982). No other sightings or strandings have been reported, so the presence of this mesoplodont in the Study Area is extremely unlikely.

Originally, the strandings and sightings were attributed to Hector’s beaked whale (*Mesoplodon hectori*). Recent studies of the DNA of the stranded specimens revealed marked differences from Hector’s beaked whale, however, leading marine mammalogists John Heyning and James Mead to conclude that the strandings represent a new species of beaked whale that they named Perrin’s beaked whale (*Mesoplodon perrini*) (Heyning and Mead 2002).

Stejneger’s beaked whale (Mesoplodon stejnegeri)

No Stejneger’s beaked whales have stranded south of Monterey, so their appearance in the study area is extremely unlikely. One Stejneger’s beaked whale was killed in a drift net off California in 1994 (Carretta *et al.* 2002).

Odontocetes: Other Beaked Whales

A list of other beaked whales in the CINMS is provided in Table C-12.

**Table C-12
Cetaceans: Odontocetes—Other Beaked Whales in the CINMS**

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Baird’s beaked whale (<i>Berardius bairdii</i>)	Stock size: 370	Protected under MMPA	Uncommon	Unknown	Slope
Cuvier’s beaked whale (<i>Ziphius cavirostris</i>)	Stock size: 5,870	Protected under MMPA	Uncommon	Unknown	Deep water

Source: Carretta *et al.* 2002

Baird’s beaked whale (Berardius bairdii)

Baird’s beaked whales are found along the slope and deep waters of the eastern North Pacific. They have been seen most frequently from late spring to early fall, leading researchers to theorize that they may venture farther offshore or to other regions for the winter. These whales are deep divers, staying down for considerable periods, thus it is not surprising that they are sighted only infrequently. Unlike the mesoplodonts, however, Baird’s beaked whales are sizable creatures, attaining some 12 meters in length. Perhaps because of this, sightings of Baird’s beaked whales, though uncommon, are still more numerous than mesoplodont sightings. The population of the California-Oregon-Washington stock is estimated at 370 animals (Carretta *et al.* 2002).

Baird’s beaked whales enjoy a cosmopolitan diet of deep-sea fish and cephalopods, as well as rockfish, mackerel, sardines, crustaceans, and sea cucumbers (Leatherwood *et al.* 2002).

Cuvier’s beaked whale (Ziphius cavirostris)

Like the mesoplodonts, Cuvier’s beaked whales inhabit offshore waters along the slope and deep ocean. They are deep divers, staying down for extended periods. Cuvier’s beaked whales can grow larger than the mesoplodonts found in the region, but other than that, they are difficult to positively identify unless

the observer is reasonably close, in good sea conditions. The best estimate of the California-Oregon-Washington population is 9,163, but this is based on sightings in California only and is likely conservative (Carretta *et al.* 2002).

Cuvier's beaked whale preys primarily on deep-sea fish and squid (Leatherwood *et al.* 2002).

Mysticetes: Right Whales

A list of right whales in the CINMS is provided in Table C-11.

Table C-13
Cetaceans: Mysticetes—Right Whales in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Northern right whale (<i>Eubalaena glacialis</i>)	Not available for region	Protected, and strategic under MMPA Endangered under ESA	Extremely rare	Unknown	Coastal

Note: ESA – Endangered Species Act
MMPA – Marine Mammal Protection Act

Source: Angliss *et al.* 2001

Northern Right Whale (Eubalaena glacialis)

Right whales are the most endangered of all the world's whales, having been hunted relentlessly in the seventeenth, eighteenth and nineteenth centuries. They are currently listed as endangered under the ESA, and depleted, protected, and strategic under the MMPA. The historic range of this species was thought to be the entire West coast, from the Bering Sea to Baja, Mexico. The pre-exploitation size of the stock was 11,000 animals. A current population estimate for the entire North Pacific is 100-200 animals (Kreitman and Schramm 1995), and it is doubted whether the species will remain extant. Recent sightings have ranged from Baja, Mexico, to Bristol Bay, Alaska, and there has been one sighting reported in the Santa Barbara Channel in 1981 (Scarff 1986).

Northern right whales are baleen whales and feed primarily on the surface by skimming zooplankton-rich patches of surface water. They have occasionally been seen bottom feeding in shallow water (Kreitman and Schramm 1995).

Mysticetes: Gray Whales

A list of gray whales in the CINMS is provided in Table C-14.

Table C-14
Cetaceans: Mysticetes—Gray Whales in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
California gray whale (<i>Eschrichtius robustus</i>)	Population: 26,635	Protected under MMPA	Common	December through May; rarely rest of year	Coastal

Notes: MMPA – Marine Mammal Protection Act

Source: Rugh *et al.* 1999.

California Gray Whale (Eschrichtius robustus)

Of the large baleen whales, the California gray whale is the only species that has been delisted from the Federal Endangered Species List; this occurred in 1994. Its population was last estimated in 1998 at 26,635 animals (Rugh *et al.* 1999).

Every year, the California gray whale migrates south from its winter feeding grounds in Alaska and the Bering Sea. Small numbers sometimes straggle from the Bering or Chukchi seas down the coast of Asia. In the past, such animals were considered a separate stock called the Korean or western Pacific stock (Leatherwood *et al.* 1982).

The vast majority of the California gray whale population begins to appear in the SCB in late December. However, individuals or small groups are often seen migrating south as early as October and November. Most of the southbound whales have passed the region by the end of February, but a few stragglers are sometimes seen later.

The northbound migration begins in February, and by the middle of the month, both south- and northbound animals may be seen in the SCB. When the northbound migration is in full swing, killer whales are most often seen in large numbers in the region. Attacks on gray whale calves and juveniles have been documented during this period. The northbound migration generally continues into May, with mother-calf pairs becoming most abundant in April. In the SCB, California gray whales are believed to utilize two main migration corridors, with several smaller corridors. The majority of both north- and southbound whales pass among the Channel Islands during both migrations. Smaller numbers pass near the mainland coast of the SCB, with greater numbers being seen during the northbound migration (Carretta *et al.* 2000; Howorth 1998). Gray whales have been reported for every month of the year, with occasional individuals lingering in the area over the summer.

Gray whales have been seen by several reliable observers feeding in drifting patches of giant kelp offshore, on isopods in established kelp beds, on mole crabs (*Emerita analoga*) in the surf, and on amphipods off shallow sandy sea floors (Anderson 1998, DeLong 1998). Still, such feeding seems largely opportunistic, and the whales generally keep moving as they feed. Migrational feeding activities are more often observed during the northbound migration, perhaps because more whales pass close to the mainland coast where they can be more readily observed.

Mysticetes: Rorquals

A list of rorquals in CINMS is provided in Table C-15.

Table C-15
Cetaceans: Mysticetes—Rorquals in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Blue whale (<i>Balaenoptera musculus</i>)	Stock size: 1,940	Protected, depleted and strategic under MMPA Endangered under ESA	Common in season	June to September; occasionally through November	Shelf and slope
Fin Whale (<i>Balaenoptera physalus</i>)	Stock size: 1,851	Protected, depleted and strategic under MMPA Endangered under ESA	Uncommon	Summer, fall; possible year-round	Shelf and slope
Sei whale (<i>Balaenoptera borealis</i>)	Not available for region	Protected, depleted and strategic under MMPA Endangered under ESA	Very rare	No longer known	Oceanic
Bryde's whale (<i>Balaenoptera edeni</i>)	Stock size: 12	Protected under MMPA	Rare	Warm water months	Shelf and slope
Minke whale (<i>Balaenoptera acutorostrata</i>)	Stock size: 631	Protected and strategic under MMPA	Uncommon	Year-round; Most abundant in summer and fall	Coastal to slope
Humpback whale (<i>Megaptera novaeangliae</i>)	Stock size: 856	Protected, depleted and strategic under MMPA Endangered under ESA	Common in season	May to September	Shelf and slope

Note: ESA – Endangered Species Act
MMPA – Marine Mammal Protection Act

Source: Carretta *et al.* 2002.

Blue Whale (Balaenoptera musculus)

Blue whales are listed as endangered under the ESA. They are considered depleted, and the California-Mexico stock is listed as strategic under the MMPA.

A best estimate of this stock size is 1,940 animals, based on line transect aerial surveys and mark-recapture studies in which identification photographs are taken of individual whales over time (Carretta *et al.* 2002). Since 1989, blue whales have been appearing in numbers in the Santa Barbara Channel. Prior

to that time, blue whale sightings were sporadic. Although blue whales have been reported at or near the region every month of the year, they generally arrive in early to mid-June and remain until August or September. Sometimes a number of individuals linger as late as November or even December. When blue whales are present in numbers in the Santa Barbara Channel, some 100 individuals may be in the area at one time. These animals seem to stay for several days or more than a week, then move on as others fill their place. The Santa Barbara Channel has prodigious quantities of krill, mainly *Euphausia pacifica*, upon which the blue whales feed.

Blue whales also frequent the Gulf of the Farallones and areas offshore from Monterey Bay in the latter part of summer and early fall. Some individuals travel into Oregon and Washington, but the California-Mexico stock does not appear to journey to Alaska. In late fall and winter, the California-Mexico blue whale stock stays off the coast of Mexico and Central America. Some venture into the Gulf of California, while others travel to the oceanic islands and to the Costa Rica Dome (Calambokidis and Steiger 1997). Little is known about the migration route from Central America and Mexico to California and back. From very limited observations and from a few satellite tags, it appears as though blue whales travel across wide expanses of deeper water offshore, then appear from west of San Nicolas Island across to Santa Rosa and San Miguel islands, entering and leaving the Santa Barbara Channel from the west.

Fin Whale (Balaenoptera physalus)

Fin whales are listed as endangered under the ESA. They are considered depleted and strategic species under the MMPA. The California-Oregon-Washington management stock is considered strategic. Population estimates of fin whales vary, but based on 1991 and 1993 ship surveys, an estimate has been made of 1,851 fin whales for this stock (Carretta *et al.* 2002). At least 148 fin whales have been photo-identified in the Gulf of California. Whether these animals are resident or are part of the California-Oregon-Washington stock is unknown at this time. Fin whale abundance dwindles off the coasts of California and Oregon in winter and spring, while it increases during the same period in the Gulf of California. This may be coincidence, however (Carretta *et al.* 2002). At least part of the population appears to spend winter and spring well off the southern California coast down to Mexico.

Fin whales are more cosmopolitan in their diet, feeding on krill, copepods, squid, and even small schooling fish (Leatherwood *et al.* 1982). They have been observed in the Santa Barbara Channel near feeding aggregations of blue and humpback whales. These individuals were feeding on the same prey, *Euphausia pacifica*, a species of krill.

Sei Whale (Balaenoptera borealis)

Sei whales are listed as endangered under the ESA and are considered depleted and strategic under the MMPA. Once commonly taken by whalers off the California coast in the 1950s and 1960s, sei whales are now quite rare (Daugherty 1985). Several extensive aerial and ship surveys from 1991 through 1993 revealed only one confirmed sighting of a sei whale (Carretta *et al.* 2002).

Bryde's Whale (Balaenoptera edeni)

Bryde's whales are common throughout the eastern tropical Pacific and are the most common balaenopterid in the Midriff region of the Gulf of California. There, 140 individuals have been photo-identified. During extensive ship and aerial surveys off California from 1991 through 1994, five possible observations of Bryde's whales were made. Bryde's whales are rare off California. The population is estimated at 12 individuals in California, Oregon, and Washington coastal waters (Carretta *et al.* 2002). The minimum overall population in the eastern tropical Pacific has been estimated at 11,163 animals.

Bryde's whales seem to prefer small schooling fish in their diet, including pilchards, anchovies, herring, and mackerel. They also feed on euphausiids (Leatherwood *et al.* 1982).

Minke Whale (Balaenoptera acutorostrata)

Minke whales are not listed under the ESA, nor are they considered depleted under the MMPA. The stock size is estimated at 631 individuals based on ship surveys in 1991, 1993, and 1996 (Carretta *et al.* 2002). Minke whales occur year-round in the region, from relatively shallow coastal areas to shelves off the north shore of the four northern Channel Islands. They appear to be most abundant from late spring through late summer although they are never seen in large numbers. Feeding activities are generally associated with small schooling fish, although they may also eat euphausiids.

Humpback Whale (Megaptera novaeangliae)

Humpback whales are endangered under the ESA and depleted and strategic under the MMPA. This particular stock is officially called the California-Oregon-Washington-Mexico stock. In reality, this stock ranges from at least Costa Rica to British Columbia. It does not mingle with the Alaska stock. Various estimates have been made for the California-Mexico stock. The most reliable estimate, obtained by mark-recapture photo-identification methods, was 856 animals (Carretta *et al.* 2002).

In winter, this stock congregates near oceanic islands off Mexico and Central America, with at least some individuals at the Costa Rica Dome. Humpback whales usually begin to appear in the region by late May and early June (Calambokidis *et al.* 2000). They generally stay until August or September. Humpback whales may stay as late as November in the western reaches of the Santa Barbara Channel. Like the blue whales, the humpback whales travel into central California in summer and early fall, occupying much the same areas. Little is known about the movements of humpback whales between Central America and Mexico to the western coastal United States, but their movements may be similar to those of the blue whales.

Although humpback whales in the region feed primarily on krill, particularly *Euphausia pacifica*, they have also been observed feeding on northern anchovies (*Engraulis mordax*), Pacific sardines (*Sardinops sagax coeruleus*), and on various small fish and amphipods in drifting patches of giant kelp (Leatherwood *et al.* 1982; Croll *et al.* 1999).

1.2.7.2 Pinnipeds

Historically, six species of pinnipeds have occurred in the northern Channel Islands. These include four members of the family Otariidae and two representatives of the family Phocidae. Two of the six species that have occurred in the Sanctuary are listed as threatened under the ESA.

Of the otariid seals, the California sea lion (*Zalophus californianus c.*) is the most abundant (Carretta *et al.* 2002). The Steller sea lion (*Eumetopias jubatus*) had two rookeries on San Miguel Island, but these rookeries have not been occupied since the 1982 to 1983 El Niño event. The eastern stock of Steller sea lions is listed as threatened under the ESA. The northern fur seal (*Callorhinus ursinus*) has two rookeries on San Miguel Island. The Guadalupe fur seal (*Arctocephalus townsendi*) has been reported on San Nicolas and San Miguel islands in very small numbers, usually from one to three individuals. A few strandings have occurred along the mainland coast (Hanni *et al.* 1997). The Guadalupe fur seal is listed as threatened under the ESA and CESA and is also fully protected under the Fish and Game Code (Section 4700).

Of the phocid seals, the northern elephant seal (*Mirounga angustirostris*) is the most common, with rookeries at San Miguel, Santa Rosa, San Nicolas, and Santa Barbara islands (Carretta *et al.* 2002). The Pacific harbor seal (*Phoca vitulina richardsi*) is common throughout the Channel Islands, with numerous haulout and rookery sites throughout the Channel Islands and along the mainland coast (Carretta *et al.* 2002). The ribbon seal (*Histiophoca fasciata*), an arctic species, has been reported twice in California (Daugherty 1985; Santa Barbara Museum of Natural History 2003).

Otariids

A list of otariids in CINMS is provided in Table C-16.

Table C-16
Pinnipeds: Otariids—Eared Seals in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat	Water Mass Preference
California sea lion (<i>Zalophus californianus c.</i>)	Stock Size: 204,000 to 214,000	Protected under MMPA	Common	Year-round	Coastal	Tropical to temperate
Steller sea lion (<i>Eumetopias jubatus</i>)	31,005	Protected and strategic under MMPA Threatened under ESA	Now extremely rare	Formerly summer and fall	Coastal	Subtemperate to subpolar
Northern fur seal (<i>Callorhinus ursinus</i>)	Stock size: 4,336	Protected under MMPA	Uncommon	May to November	Pelagic	Subtemperate to subpolar
Guadalupe fur seal (<i>Arctocephalus townsendi</i>)	Population: 7,408	Protected, depleted, and strategic under MMPA Threatened under ESA	Rare	Summer and fall	Pelagic	Subtropical to temperate

Note: ESA – Endangered Species Act
MMPA – Marine Mammal Protection Act

Source: Carretta *et al.* 2002.

California Sea Lion (*Zalophus californianus c.*)

The California sea lion consists of three subspecies: *Zalophus californianus japonicus*, which occurred off Japan and is now thought to be extinct; *Zalophus californianus wollebaeki*, found at the Galapagos Islands; and *Zalophus californianus californianus*, found from Baja California to British Columbia. The latter population is divided into three stocks. The range of the Gulf of California stock is as indicated by the name; the western Baja California stock extends from the southern tip of Baja California to the California border; and the U.S. stock ranges from California through Washington. The United States stock size has been estimated at 204,000 to 214,000 animals (Carretta *et al.* 2002).

California sea lions have two main rookeries at the Channel Islands, one at San Miguel Island, the other at San Nicolas Island. Other rookeries exist at Santa Barbara and San Clemente islands. Several haul-out

sites exist on Santa Cruz and Anacapa islands. California sea lions are a coastal species, seldom venturing much past the Continental Borderland. Adult male California sea lions usually haul out from May into early August to defend their beach territories and breed. After mating, they head north, some reaching as far as British Columbia. The females linger with their pups, which are weaned at 4 to 10 months. Some continue to nurse for up to a year.

The females generally stay at the island haulout sites or near the mainland coast as far north as Monterey, as do the juveniles. A few adult males also linger in this region. California sea lions feed on small schooling fish and market squid (*Loligo opalescens*).

Steller Sea Lion (Eumetopias jubatus)

Steller sea lions were reclassified into two separate stocks within United States waters in 1997: the eastern stock, including animals east of Cape Suckling, Alaska (144 degrees west longitude); and the western stock, including animals at and west of Cape Suckling. The eastern stock of Steller sea lions is threatened under the ESA, while the western stock is endangered because of major population declines. Both populations are now considered strategic and depleted. Reduced prey stocks from overfishing during critical times and locations resulted in the decimation of the western population (NMFS 2000). Regionally, the 1982–1983 El Niño event may have contributed to the decline of this species (Angliss *et al.* 2001).

The most recent abundance estimate of the eastern stock of Steller sea lions is based on combined surveys conducted in Southeast Alaska (15,173 animals), British Columbia (9,277), and Washington, Oregon and California (6,555). Combining the total count for the three regions results in a minimum estimated abundance of 31,005 Steller sea lions (Angliss *et al.* 2001). Trends in Steller sea lion abundance for the three regions have been slightly variable over the past two decades. Steller sea lion numbers in California, especially southern and central California, have declined considerably, from 5,000 to 7,000 non-pups from 1927–1947 to 1,500 non-pups between 1980 and 1998 (Angliss *et al.* 2001).

Critical habitat for the Steller sea lion was established in 1993 (58 FR 45269) and includes all major rookeries for the eastern stock. In California, rookeries at Año Nuevo Island, Southeast Farallon Islands and Sugarloaf Island, off Cape Mendocino, are considered critical habitat (NMFS 2000). Año Nuevo Island, the closest critical habitat to the SCB and the southernmost breeding site for this species, is hundreds of miles to the north in Santa Cruz County. No critical habitat exists for this species in the SCB (NMFS 2000).

The Steller sea lion was last reported at San Miguel Island during the 1982–1983 El Niño (NMFS 1992 and 2000). Historically, Steller sea lions have been seen occasionally at San Nicolas Island but have not been observed there for decades (Bartholomew 1951; Bartholomew and Boolotian 1960). Steller sea lions once appeared in early summer and remained into the fall at San Miguel Island. A similar pattern continues at the Año Nuevo Island colony. Steller sea lions prefer cold temperate waters.

Steller sea lions feed on a variety of fish, including the walleye pollock or black cod (*Theragra chalcogramma*), once a major prey item (Angliss *et al.* 2001; NMFS 1992 and 2000).

Northern Fur Seal (Callorhinus ursinus)

The northern or Alaskan fur seal has two rookeries of approximately 4,500 animals at San Miguel Island. These were reestablished in the late 1950s. The two rookeries have grown over the years to an estimated

4,336 animals (Carretta *et al.* 2002). At San Miguel Island, adult males usually arrive in May and stay through August. Some will stay as late as November, along with the females, although they will not maintain territories much beyond August. By November, most adults have left for the open ocean, where they will spend the next seven to eight months. Many pups will spend the next 22 months at sea after they have been weaned, finally returning to the rookeries where they were born. Northern fur seals are pelagic, frequenting offshore waters in search of fish and squid.

Guadalupe Fur Seal (Arctocephalus townsendi)

The Guadalupe fur seal is listed as threatened under the ESA. It is considered depleted under the MMPA and is also fully protected under Fish and Game Code (Section 4700). The California-Mexico stock is considered strategic under the MMPA. The latest estimate of this population is 7,408 animals (Carretta *et al.* 2002), virtually all of which are found in Mexican waters at Guadalupe Island. A pup was born on San Miguel Island in 1997 (Melin and DeLong 1999).

Phocids

A list of phocids is provided in Table C-17.

Table C-17
Pinnipeds: Phocids—True Seals in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Northern elephant seal (<i>Mirounga angustirostris</i>)	Stock size: 101,000	Protected under MMPA	Common in season	December to August	Deep benthic
Pacific harbor seal (<i>Phoca vitulina richardsi</i>)	Stock size: 30,293	Protected under MMPA	Common	Year-round	Coastal
Ribbon seal (<i>Histiophoca fasciata</i>)	Not applicable	Protected under MMPA	Extremely rare	Not applicable	Arctic

Note: MMPA – Marine Mammal Protection Act

Source: Carretta *et al.* 2002, Santa Barbara Museum of Natural History 2003, Daugherty 1985.

Northern Elephant Seal (Mirounga angustirostris)

The California population is considered a separate stock (Carretta *et al.* 2002). Northern elephant seals have two large rookeries on San Miguel and San Nicolas islands. Smaller rookeries are found on Santa Barbara and Santa Rosa islands. They have also been reported at Santa Cruz and Anacapa islands but have not established rookeries there. The California stock was estimated at 101,000 animals in 1996 (Carretta *et al.* 2002).

Northern elephant seals migrate to California twice from feeding grounds as far north as the Aleutian Islands and the Gulf of Alaska (for the males) and to areas off the Oregon coast (for the females). They migrate once to bear their young and breed, then a second time to molt. The pupping and breeding season extends from December through March. The molting season is between March and August. Males generally arrive later than the females. Northern elephant seals feed on deepwater organisms including bony fish, sharks, skates, rays, and squid, and octopus.

Pacific Harbor Seal (*Phoca vitulina richardsi*)

Two subspecies of harbor seals exist in the Pacific, *Phoca vitulina stejnegeri*, which is found in the western Pacific and in northern Japan and *Phoca vitulina richardsi*, which ranges from the Pribilof Islands in the Bering Sea to Baja California. The Pacific harbor seal is well distributed in California, with 400 to 500 haulout sites along the mainland coast at river mouths, estuaries, beaches, offshore rocks, and islands, including San Francisco Bay, as well as at the Channel Islands. Harbor seals usually do not roam far from their haulout and rookery areas, although a few individuals may wander a few hundred kilometers. The best estimate of the California stock is 30,293 animals (Carretta *et al.* 2002).

Harbor seals pup from February through May. Some pups have been reported in December and January at several rookeries. The most animals can be seen ashore at the Channel Islands during the molting season, which peaks from late May to early June. Harbor seals prey mostly on various species of bottom fish and octopi.

Ribbon seal (*Histiophoca fasciata*)

Please see note under Pinnipeds, above.

Carnivores: Mustelids

A list of mustelids in the CINMS is provided in Table C-18.

Table C-18
Carnivores: Mustelids – Sea Otters in the CINMS

Species	Population or Stock Size	Protected Status	Relative Abundance	Seasonality	Normal Habitat
Southern sea otter (<i>Enhydra lutris nereis</i>)	Stock size: 2,505	Protected, depleted, and strategic under MMPA Threatened under ESA	Most abundant in spring in region	Year round	Coastal

Note: ESA – Endangered Species Act
MMPA – Marine Mammal Protection Act

Source: USGS 2003.

Southern Sea Otter (*Enhydra lutris nereis*)

The southern sea otter is listed as threatened under the federal ESA and is considered depleted and strategic under the MMPA. In general, the California population has been slowly but steadily increasing since the discovery of a remnant colony off Bixby Creek in central California in 1937. Some declines have occurred following El Niño events, however (U.S. Geological Survey [USGS] 1999 and 2001). Recent spring counts reflect these fluctuations: in 1998, the count was 2,114; in 1999, it was 2,090; in 2000, 2,317; in 2001, 2,161; in 2002, 2,139; and in 2003, 2,505, the highest count recorded since modern census techniques were developed for the sea otter (USGS 2003). The data suggest a gradual but statistically significant population increase of about 0.9% a year since 1998, although the latest count, conducted in good observation conditions, may have skewed the data (USGS 2003). While no single year's survey result is indicative of a population change, researchers and managers remain concerned at

the overall slow rate of growth for the threatened California sea otter. Cooperative research efforts are ongoing to try to understand why the otter's recovery has been so slow.

The California stock of sea otters ranges from Point Conception north to Año Nuevo Island, in Santa Cruz County. This population is concentrated near the coast in waters up to about 20 meters deep, although some otters can be found out to about 40 meters of water depth. Few otters have been sighted north of Año Nuevo Island, where the northward spread seems to have stopped. Predation by great white sharks (*Carcharodon carcharias*) likely has contributed to the cessation of range expansion to the north (Ames *et al.* 1996).

From 1987 to 1990, the USFWS, which has primary jurisdiction over sea otters, translocated 139 otters to San Nicolas Island. The translocation effort has not been considered a success. In 2003, 33 animals were reported there. Whether these animals are part of the translocated stock, offspring from the translocated stock, others that have moved there, or a combination of these possibilities, is unknown (Sanders 2003).

Southern sea otters eat certain mollusks, crustaceans, and echinoderms. Unlike Alaskan otters, they do not appear to eat fish.

1.2.7.3 Special-Status Marine Mammal Species

The federal Endangered Species Act (ESA) provides measures to conserve and recover listed species. NMFS is charged with implementation of the ESA for all marine mammals in the SCB except the southern sea otter, which is handled by the USFWS. Section 7 of the ESA requires that federal agencies ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. Likewise, the California Endangered Species Act prioritizes the protection and recovery of listed endangered or threatened species and their habitats. The ESA requires NMFS and the USFWS to develop recovery plans for species added to the list of Threatened and Endangered (T&E) species. The Recovery Plans describe conservation measures to ensure recovery of the listed species.

The State also designates protection to one marine mammal under the California Endangered Species Act (CESA). In addition, the California Fish and Game Code (Section 4700) designates several marine mammal species as fully protected (northern elephant seal, Guadalupe fur seal, Pacific right whale, and southern sea otter). Fully protected mammals may not be taken or possessed at any time, and no provision may be made to allow incidental take.

Under the ESA, an endangered species is defined as "any species which is in danger of extinction throughout all or a significant portion of its range." Six whale species occurring in California waters are listed as endangered. A threatened species is "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The Steller sea lion, Guadalupe fur seal, and southern sea otter are the only marine mammal species occurring in California waters that are listed as threatened. The Guadalupe fur seal is also listed under the CESA as threatened.

A candidate species is "any species being considered by the Secretary for listing as an endangered or threatened species, but not yet the subject of a proposed rule." There are no candidate marine mammal species found in California waters.

All marine mammals are protected under the Federal Marine Mammal Protection Act (MMPA 1972, amended 1994) administered by NMFS and the USFWS. In addition, NMFS and the USFWS grant at-risk marine mammal stocks additional protection under the ESA with endangered, threatened, and

depleted status designations. The MMPA also provides designations for at-risk marine mammal stocks. A species or a stock of a species is designated as depleted when it falls below its Optimum Sustainable Population (OSP) or, if the species is listed under ESA. Six whale species and the southern sea otter are considered depleted. The MMPA also lists a stock as strategic if: 1) it is listed as a T&E species under ESA; or 2) the stock is declining and likely to be listed as threatened under the ESA; or 3) the stock is listed as depleted under the MMPA; or 4) the stock has direct human-caused mortality which exceeds that stock's Potential Biological Removals (PBR) level. The term PBR is defined as "the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its OSP" (Carretta *et al.* 2002). As mandated in the 1994 amendments to the MMPA, NMFS develops estimates of PBR's for each marine mammal stock in U.S. waters.

NMFS issues permits through the Marine Mammal Authorization Program (MMAP) to provide an exception for commercial fishers from the general taking prohibitions of the MMPA. The owner of a vessel or non-vessel gear participating in a Category I or II fishery must obtain authorization from NMFS in order to lawfully incidentally take a marine mammal in a commercial fishery, while those participating in Category III fisheries may incidentally take marine mammals without registering for or receiving an authorization (NMFS/NOAA/OPR 2001). For those species under NMFS' jurisdiction, permits may be issued for the incidental, but not intentional, taking of marine mammals listed as T&E under the ESA. With the 1994 amendments to the MMPA, intentional takes of marine mammals are now illegal except when imminently necessary in self-defense or to save the life of another person.

2.0 HISTORICAL/CULTURAL RESOURCES

Historical/cultural resources in the Study Area are discussed below including existing data sources and key threats to the resources

2.1 DATA SOURCES

2.1.1 Historical Research

Prior to 1976, when a paper was published by Hudson on marine archaeology in the region, little work had been done in this area. Before the 1950s, probably all the marine finds were made in the intertidal region, and few of these were likely reported (Hudson 1976). The earliest known stone artifact was made by an American Indian, and found by Orr in a cemetery on Santa Rosa Island; he dated the artifact at about 4,000 years B.P. (1968). It was riddled with borings from marine organisms, both inside and out, indicating that it had been manufactured, somehow deposited in the sea, then later recovered.

In the 1870s, a stone vessel was found during a very low tide near the site of the Chumash village of Syuxtun, near what is now the foot of Bath and Chapala streets in Santa Barbara. This was the first recorded marine discovery in the region. Other artifacts were later found there, eroded out of nearby cemeteries and middens.

In 1928, another vessel was found in Carpinteria, followed 2 years later by yet another, recorded by Wallace and Kritzman (1956). In 1944, the late Campbell Grant, well-known for his work on Chumash rock art, recovered a bowl at Rincon Point. Two grooved stones were found in Montecito in 1934 and 1937. Other finds were undoubtedly made but never reported (Hudson 1976).

From 1950 on, numerous finds were made throughout much of the Study Area by recreational scuba divers and commercial abalone and sea urchin divers. These finds were enumerated in several comprehensive studies (Hudson 1976; Hudson and Howorth 1985; Howorth and Hudson 1993). During the first study, 26 sites were identified along the mainland coast of the Study Area, and 6 at the four northern Channel Islands. Artifacts from all sites totaled 92 (Hudson 1976).

In the next study, which built on the earlier work, the number of artifacts totaled over 150, while the number of mainland sites had increased to 35. Island sites had increased to 17, not counting an additional 4 sites at San Nicolas Island, which is not in the existing Sanctuary or Study Area (Hudson and Howorth 1985). In the last study, confined to the existing Sanctuary, 18 sites were recorded (Howorth and Hudson 1993). Since then, an additional site was found at the northern Channel Islands. To date, no marine archaeological sites have been found at Santa Barbara Island. Another site was reported for the mainland coast of the Study Area.

Most submerged archaeological finds to date have been fortuitous rather than systematic. Such finds have been made mainly by divers who are not trained archaeologists. Not surprisingly, stone vessels, which are large, relatively indestructible and easily recognizable, comprise the majority of finds. In Hudson's 1976 study, a sampling of 68 artifacts revealed 56 stone vessels, vessel blanks, or basket hopper mortars. Six of the remainder were grooved stones; the others consisted of metates, pestles, donut stones, and scrapers.

In 1961, divers from Scripps Institution of Oceanography investigated a site off Santa Rosa Island and found a large concentration of bowls. In 1974 and 1975, two undersea archaeological expeditions were undertaken in the Study Area through the Santa Barbara Museum of Natural History (Hudson 1976; Hudson and Howorth 1985). The first expedition was to see if a helmet-mounted video camera could allow a topside archaeologist to monitor a systematic diver search of the sea floor. In 1975, a qualified archaeologist, investigating a known submerged archaeological site, did find an artifact. The object was a unifacially worked sandstone tool that a diver not trained in archaeology would have missed (Hudson 1976).

In 1977, a diver-archaeologist performed a systematic search of an area near Point Conception proposed for a liquefied natural gas port, using a line transect survey method. He did not find any artifacts. Later, however, a marine biologist recovered a charmstone from the same area (Hudson 1976; Hudson and Howorth 1985).

These studies show that even trained archaeologists will not necessarily locate artifacts during surveys. The problems of sand or algae covering the material, limited underwater visibility, and numerous other factors limit undersea archaeology.

Hudson (1976) concluded that the sampling of submerged cultural resource sites was biased, based on the following observations:

- The distribution of sites was dependent upon the frequency of diving activities or beachwalkers at low tides;
- Fewer people walked beaches at the Channel Islands;
- Shallow, nearshore areas were visited more frequently by divers than deep-water sites;
- Deep sites were rarely visited because of limited dive times;

- Finds were haphazardly reported;
- Little data were available on geomorphology, such as the presence of ancient streambeds;
- No systematic surveys had been undertaken, at least within the Sanctuary; and
- Remote sensing equipment had not located any submerged sites.

Despite the sampling bias, however, a considerable volume of previously unpublished data on submerged cultural resources sites was revealed in Hudson's 1976 study and in subsequent studies (Hudson and Howorth 1985; Howorth and Hudson 1993).

2.1.2 Contemporary Research

A preliminary search of primary source material, contemporary newspaper accounts, survivor diaries, oral interviews, published databases and reports, and popular literature on shipwrecks was conducted. In addition to documenting the shipwreck events, the maritime activities associated with these historic resources must be put into context. Lima (1994) described the process in five steps: (1) identifying vessels lost in an area; (2) gathering data about the vessels; (3) identifying and documenting actual wreck sites; (4) interpreting the research findings; and (5) disseminating the research findings. This same process can be applied to other historic resources, such as aircraft and historic land use sites.

In 1985, research was completed and a report was published by Hudson and Howorth. This report included a review of earlier findings by Pierson and Stickel (1977) Pierson (1980), and Pierson et al. (1987). It also included many new findings made by Hudson and Howorth. An updated report was prepared in 1993 (Howorth and Hudson), which listed a total of 105 shipwrecks in the CINMS.

In 1996, Morris and Lima published a submerged cultural resources assessment for CINP. Although this assessment addressed shipwrecks and aircraft losses in Sanctuary waters from 1853 to 1980, it did not include the Study Area, nor did Hudson and Howorth's earlier studies (1985 and 1993). Lima (1999) provided a shipwreck study for publication in an EIS prepared for the U.S. Navy at Point Mugu, California. This publication addressed the complete Study Area, but it only provided each vessel's name, rig, date built, date lost, and how the vessel was lost. It did not include a historical profile for each vessel or detailed circumstances surrounding each loss. Gearhart *et al.* (1990) provided broad historic narratives of the Study Area with some discussion on regional losses, but it did not represent a full assessment of the resources. Four government shipwreck databases provided vessel listings but only limited information on the historical significance of these resources (California State Lands Commission 2000; NOAA 2000a, b; U.S. Navy 2000). Schwemmer and Gamble's shipwreck database (2000) represents an ongoing study of ship and aircraft casualties for the four western states.

2.2 THREATS TO SUBMERGED HISTORICAL/CULTURAL RESOURCES

With the development of underwater technologies that bring the public physically and virtually closer to the marine environment, there is increasing interest in submerged historical/cultural resources (SCRs). Protection and management of these historically significant resources can provide the public with a variety of education, research and recreation opportunities. The continuing discovery, exploration, documentation and study of these resources provide a richer understanding of the region's maritime community, which is an important component of the larger ecosystem the CINMS is protecting. SCRs provide an excellent historical record to past human behavior patterns and uses in the Sanctuary.

SCRs are subject to irreversible damage and can be severely compromised by human and environmental impacts. Although the Sanctuary allows certain compatible activities, its overriding responsibility is to protect both historical/cultural and natural resources for current and future generations.

To gain a better understanding of the past, researchers strive to study SCRs in their original context. The relationship of one artifact to another is important and if an artifact is moved or altered, it can affect the way researchers understand and interpret an SCR site.

There are two principal threats to SCRs: human behavior and natural phenomenon. While little can be done to minimize the damage from natural events (with the exception of removing delicate artifacts for conservation and research), human behavior may be managed through education, adequate regulations and effective enforcement. Evaluating the threats to SCRs of the Sanctuary requires further research because so few sites have been located and thoroughly surveyed. As such, NOAA's policy is *in situ* preservation but recognizes that the removal of historical/cultural artifacts is sometimes necessary. The conditions in which removing an artifact may be necessary include:

- Protecting artifacts from harsh environmental conditions;
- Protecting artifacts from human impacts such as looting;
- Conducting research in a controlled environment; and
- Making artifacts more readily available to educate the public.

2.2.1 Human Threats

Site looting (where objects are intentionally pilfered from submerged sites) is the single largest threat to SCRs. This act has the potential to be more damaging than controlled salvage since it is an act of wanton destruction and theft. Artifacts that are small and light enough for divers to carry are pilfered most often. Larger structures of shipwrecks are less likely to be stolen, but may be vandalized, intentionally defaced, or destroyed in search of recoverable artifacts. Most events go unnoticed, while some cases occurring in the Sanctuary have been documented with evidence for successful prosecution.

Sometimes through the process of recovery, important archaeological contexts are destroyed. Attempted conservation by over-zealous cleaning may remove important evidence about the artifact, its usage and the associated site, or destroy the protective coatings that enabled it to survive in the first place. Some artifacts are discarded when they are found to have little or no monetary value and/or the novelty of discovery has worn off, while others are neglected and allowed to fall into decay (Robinson 1998).

Divers who may not have any intentions to loot or vandalize artifacts may still cause damage through poor diving techniques or tampering. Divers may inadvertently harm resources by kicking up sand from the bottom, holding onto artifacts or accidentally breaking fragile resources when striking them with scuba tanks. Even if the intent was not to steal or damage the resources, permanent destruction to non-renewable artifacts can be inflicted.

Vessel activity can also cause serious damage to SCRs. An anchor dropped on an artifact can result in serious and permanent damage or drag it away from the context of its original site location. Seabed disturbance by mobile bottom fishing gear has emerged as a concern due to the damaging effects of heavy trawl doors and nets dragging through archaeological sites.

Modern ship groundings can have seriously impacted SCRs in the various sites worldwide. A large vessel that grounds on an archaeological site may destroy and permanently bury historical/cultural artifacts under tons of modern steel and debris. The impacts of oil spills from bunker fuels and petroleum cargoes covering historical resources have largely been overlooked. Petroleum products that sink can physically smother resources. Due to the increase in carbon, oil contamination from a modern shipwreck may also impede the radiocarbon dating processes.

The process of trenching communications cables can have permanently damaging effects to submerged archaeological resources during grappling and (sea) cable installation. To mitigate such a threat, qualified archaeologists are required to conduct historical resources inventories and avoidance plans with supervised magnetometer and side-scan surveys of the proposed regions.

The laying of oil pipelines and other structures that support offshore oil and gas processing facilities can destroy historical resources. Dredging operations to clear harbor entrances can destroy and/or dislodge submerged archaeological resources, thus losing important clues to their history.

2.2.2 Natural Threats

Although there is little that can be done to protect artifacts from natural processes, the Sanctuary staff recognize these threats and, when possible, will attempt to mitigate their impacts. Most damage to shipwrecks occurs in the first few decades of their sinking. Shipwrecks tend to stabilize with the environment (sustaining fewer damaging effects) after twenty or thirty years.

Shipwrecks in shallow water environments within higher energy zones are much more likely to be subjected to damage by waves, shifting sands and strong currents. Wave action carries a tremendous amount of energy that can easily break up a shipwreck and physically pull it apart, whereas shipwrecks in deeper and calmer waters are generally in a more stable environment, therefore limiting physical effects. Cold and deep-water environments tend to have fewer biological processes that accelerate ship degradation as that found in shallower sites.

Shipworms (*Teredo diegensis*) inhabit and burrow through wood material, rapidly destroying its structure. Evidence of these shipworms is common among wooden shipwrecks in the Sanctuary. Sea urchins secrete acid that dissolves small, cup-shaped depressions into rocky reef ledges. Creatures living on the surface of historical resources also have the potential to inflict damage. Rock-boring clams, tubeworms and other organisms can have destructive results, even on stone artifacts.

2.3 OVERVIEW OF HISTORICAL/CULTURAL RESOURCES IN STUDY AREA

Submerged historical/cultural resource sites are abundant within the Study Area. Several theories explain the presence of such sites and are presented in the next section. Erosion is the single largest factor that continues to deposit archaeological material into the marine environment. Wave and streambed erosion, and cliff retreat from wind, runoff and even earthquakes, all result in the deposition of archaeological material into the sea. On the four northern Channel Islands, where such material is abundant in blufftop middens and in burial grounds, the process is inevitable. Given the almost continuous length of insular coastline capped by archaeological remains, one should expect the presence of marine finds almost everywhere offshore of these islands (Hudson and Howorth 1985; Howorth and Hudson 1993). This process also occurs, although to a lesser extent, along the mainland coast of the Study Area south of Point Conception. From Point Conception north, such sites are quite abundant (Lebow 2000). (Hudson and Howorth 1985; Hudson 1976). Throughout the Study Area, such sites are probably under-reported.

Along the mainland coast, most eroding sites lead directly to the intertidal zone, which is subject to the weathering effects of sun, windblown sand, scouring from wave-driven sand, pounding by rock rubble, and direct surf action, in addition to the effects of rock-boring clams and other organisms. Some island sites are also characterized by the same influences. For these reasons, only the hardiest of artifacts, such as stone vessels and pestles, usually survive over time in such areas.

Along some sections of the Channel Islands, however, eroding coastal bluffs are perched over relatively deep, semi-protected waters. Material falling into the sea from such sites is subject only to damage while falling. Once submerged, the material is more prone to damage from biological organisms than from physical impacts. This may account for one diver's find of two vessels, a doughnut stone, a scraper, and some human bones (Hudson 1976).

A few other areas have yielded small concentrations of artifacts. At Santa Cruz and Santa Rosa islands, a number of stone vessels were reported in two separate sites (Hudson 1976; Morris 2000). Along the mainland coast, repeated finds have been made in two intertidal and four subtidal sites (Anderson 2000; Hudson 1976; Hudson and Howorth 1985). The remainder of finds has been widely dispersed and almost always involved single artifacts (Hudson 1976; Hudson and Howorth 1985).

Historical/cultural resources include shipwrecks, aircraft wrecks, and material associated with ocean piers. In many of the historical/cultural resources reported as total losses, some portion of the hull remains in position. Exposure to currents, tides, and sediment movements in high-energy beach and nearshore waters greatly reduce the potential of preservation, however. In addition, vessels located in shallow waters are more susceptible to commercial salvage and modern-day souvenir hunters. Submerged remains found in deep water are in a more stable environment and are in a better state of preservation. Vessels and aircraft built of metal construction have a greater potential for preservation than wood or composite (metal and wood) resources (McClelland Engineers, Inc. 1985).

Caution must be applied when reviewing casualty reports. When reporting vessel and aircraft casualties, the most prominent land area, island, harbor, or port is given as the location of the loss. This practice continues to this day. In many cases, the actual location of the loss site may be many miles from the geographic location given. Several vessels have been reported lost off Point Arguello and Point Conception, where in reality they were not lost there (Schwemmer and Gamble 2000).

Within certain regions in the Study Area, shipwrecks have concentrated in a relatively small geographic area. Point Pedernales, to the north of Point Arguello, is one such example. This region of the coast is frequently shrouded in fog, which prevented early mariners from spotting the dangers of this rugged shoreline. At Point Pedernales, several ships, representing the various coastal trades, ran aground on the treacherous reefs. The Gold Rush passenger side-wheel steamer *Yankee Blade* was lost in 1854 after striking one of the submerged rocks in fog. Just north of the point, the passenger steamer *Santa Rosa* was lost in 1911, and 20 years later another passenger steamer, the *Harvard*, became stranded. Also victims of fog were nine U.S. naval destroyers that struck the rocks in 1923. Seven warships became total losses: USS *Delphy*, USS *Chauncey*, USS *Young*, USS *Woodbury*, USS *Fuller*, USS *S.P. Lee*, and USS *Nicholas*. Ten years later, the Japanese freighter *Nippon Maru* came to rest on the rocks, a total loss. On the same day that the destroyers were stranded in 1923, the passenger-cargo steamer *Cuba* stranded in fog at Point Bennett, San Miguel Island. Point Bennett is located at the west end of the island and marks the southern boundary of the entrance into the west Santa Barbara Channel, with Point Conception marking the northern boundary. Several vessel casualties have occurred on the outlying reefs of Point Bennett. In the same year the *Cuba* was lost, the four-masted schooner *Watson A. West* stranded. The sealing schooner *Leader* was lost in 1876. The two-masted schooner *G.W. Prescott*, carrying a load of railroad ties, was lost in 1879. In 1905, another lumber carrier, the three-masted schooner *J.M. Colman*, was lost. During the filming of "Mutiny On The Bounty" in 1935, the movie barge *W.T. Co. No. 3* foundered off the point.

In more recent years, the 1957 transpacific yacht race winner *Legend* became stranded in 1967. Near Point Bennett lie the remains of still more vessels, including the three-masted schooner *Comet*, lost in 1911. Two larger steamers, the tanker *Pectan* (1914) and cargo carrier *Anubis* (1908), stranded near Point Bennett, but they were ultimately re-floated (Morris and Lima 1996). As late as 1997, the commercial fishing vessel *Lady Christine* stranded near the point and was re-floated several months later.

2.4 HISTORICAL/CULTURAL RESOURCES IN THE STUDY AREA

2.4.1 Submerged Historical/Cultural Resource Sites

2.4.1.1 Cultural History

Numerous concepts have been proposed for dividing American Indian people in this region into various cultures spanning different time periods. The designation “Arlington Springs Man,” mentioned by Orr (1968) is still in use today but refers to a specific site on the northwest coast of Santa Rosa Island. This site, now known as the “Arlington Springs Woman,” has been dated at 13,000 years Before Present (B.P.) On San Miguel Island, eelgrass matting from a cave was examined and found to be approximately 11,000 years old. This cave was occupied more or less continually for 11 millennia (Morris 2000). At Vandenberg AFB, within the Study Area, another site was dated at 9,000 years B.P.

These early sites represent part of what has been called the Paleoindian Period, which dates from about 13,000 to 8,500 years B.P. This is the first of six periods currently recognized by most archaeologists. During the Paleoindian Period, people lived in small groups, collecting intertidal organisms and seeds. The earliest people may have encountered island pygmy mammoths, possibly hunting them to extinction. The climate was cool and wet at this time, supporting large pine forests.

The next period, known as the Oak Grove in earlier literature, existed from 8,500 to 6,500 years B.P. This is now called the Initial Early Period or Millingstone Horizon because of the prevalence of millingstones in the archaeological record. These stones consisted of basin metates and manos (grinding stones) used for grinding seeds into meal. Intertidal shellfish supplied protein, since hunting and fishing were not particularly important. The climate remained cool and moist, with abundant pine forests.

Little is known about the Altithermal Period, which extended from 6,500 to 5,000 years B.P. During this time, the climate became considerably warmer and drier and the pine forests declined severely. The human population seems to have been markedly reduced.

The Terminal Early Period, occurring from 5,000 to 3,200 years B.P., showed many changes, heralded by increased populations, use of large stone bowls to grind acorn meal, and tools for hunting large mammals, even though shellfish remained a staple part of the diet. This culture spoke a “proto-Chumash” language. The connection of this culture to earlier cultures is unknown.

At the Channel Islands, four submerged archaeological sites yielded artifacts that Hudson dated at between 4,000 to 9,000 years B.P. (Howorth and Hudson 1993; Hudson and Howorth 1985). Along the mainland coast, eight sites produced artifacts from this same range of time. Determination of this time frame was based on two approaches: first, that these sites represented submerged village sites at locations that were once above water; second, that artifacts at these sites could be dated by comparing them with comparable artifacts recovered from terrestrial sites for which more accurate dating methods were available. Vessel types made during this time frame apparently spanned several currently accepted cultural time periods.

During the Middle Period, from 3,200 to 800 years B.P., reliance on fish and marine mammals became more significant. With the invention of the planked canoe or tomol about 2,000 years B.P., maritime activities and inter-island and island-mainland trade became far more prolific. During the same time, coastal communities flourished. Two droughts resulted in decreased resources and increased warfare between various groups in the region.

The Late Period extended from 800 years B.P. to the missionization of the Chumash. This period was marked by increases in fishing activities, notably in the netting of sardines. Terrestrial animals and plants supplemented the marine diet. Selective burning of coastal plant communities augmented seed production. Money made from purple olive shells (*Olivella biplicata*) helped support coastal communities through trade during lean times although territorial disputes often led to warfare. The name Chumash is derived from the word meaning “makers of shell bead money.”

The majority of artifacts discovered in the Study Area represent these last three periods (Howorth and Hudson 1993; Hudson 1976; Hudson and Howorth 1985). This perhaps is not surprising, given that some artifacts are becoming marine even today and that submerged artifacts of great antiquity seem to be comparatively scarcer, as are terrestrial artifacts of great age.

From 1772 to 1822, the Chumash were brought to the missions, profoundly altering their way of life. (The last island Indian, the famous Lone Woman of San Nicolas, was brought to Santa Barbara in 1853. She was Nicoleño, however, not Chumash.)

2.4.1.2 Theories Explaining the Presence of Historical/Cultural Material Underwater

Hudson and Howorth (1985) reviewed ten different possible explanations for the presence of submerged historical/cultural resources:

- Ceremonial deposition;
- Anchors (fishing stations);
- Eustatic changes;
- Cliff erosion;
- Material washed out to sea from coastal streams;
- Earthmoving activities;
- Random loss;
- Cairns;
- Ballast; and
- Coastal subsistence.

Hudson concluded that the first four of these theories were feasible for this region and added “unknown” as a fifth category. He did acknowledge that some of the other theories could be applicable in certain circumstances. For example, intertidal archaeological finds in the vicinity of the Santa Barbara Harbor ceased after the harbor was built and the area became covered with sand as a result of the altered

coastline. He also acknowledged that material could have been randomly lost, jettisoned, or sunk from watercraft, including cargoes as well as ballast. This theory was included in a later study (Howorth and Hudson 1993).

Regarding ceremonial deposition, Hudson believed that “supervessels,” huge stone vessels up to a meter or more in height, may have been deliberately dropped into the sea. Two such vessels were reported off Anacapa Island, one off Santa Cruz and another off San Miguel. In addition, a concentration of small vessels was found in at least one site off Santa Rosa Island (Howorth and Hudson 1993). Finally, aggregates of stone vessels have been found in at least five sites immediately east of Point Conception, which was known to be sacred to the Chumash (Hudson 1976; Hudson and Howorth 1993). A charmstone was also found in the same area (Hudson 1979; Hudson and Howorth 1985). Six grooved stones, probably representing net anchors, have been found at two mainland coast sites east of Point Conception (Hudson 1976; Hudson and Howorth 1985).

Eustatic changes may account for artifacts found in deeper water representing earlier periods. At the end of the last ice age some 18,000 years ago, huge volumes of water were released as the ice melted, literally raising global sea levels. This process continued until 2,000 to 3,000 years ago (Howorth and Hudson 1993; Hudson 1976; Hudson and Howorth 1985). Coastal village sites representing earlier periods were likely submerged as sea levels rose. Projections of ancient coastlines, established by radiocarbon-dating marine organisms, have been made for the Holocene (12,000 years B.P. to the present). Artifacts found along what is believed to be ancient shorelines were compared to those in dated terrestrial archaeological sites. Hudson concluded that nine sites along the mainland coast and four sites at the islands represented submerged village sites (Hudson 1976; Hudson and Howorth 1985).

As mentioned earlier, erosion of coastal bluffs, both at the Channel Islands and along the mainland coast, undoubtedly results in archaeological material falling into the sea. At least three sites along the mainland coast and two at Santa Cruz Island were the result of erosion (Howorth and Hudson 1993; Hudson 1976; Hudson and Howorth 1985;). Such sites are probably grossly under-reported.

2.4.1.3 Distribution of Submerged Historical/Cultural Resource Sites

A total of 18 submerged historical/cultural resource sites exists off the four northern Channel Islands: three off Anacapa; seven off Santa Cruz; three off Santa Rosa; and five off San Miguel (Howorth and Hudson 1993). A number of artifacts have been recovered from these sites, while others have been reported and left in place. Again, the number of marine archaeological sites caused by erosion is likely to be grossly under-reported, particularly at the Channel Islands, where few people walk the beaches at low tide.

Along the mainland coast of the Study Area, 35 sites exist (Hudson and Howorth 1985). Again, it is likely that marine archaeological sites caused by erosion are under-reported, especially in areas characterized by cliff retreat from erosion. Numerous middens on top of coastal bluffs can be found west of Santa Barbara to the northern limit of the Study Area.

Detailed discussions of both Channel Islands and mainland sites can be found in three documents (Howorth and Hudson 1993; Hudson 1976; Hudson and Howorth 1985).

2.4.2 Submerged Historical/Cultural Resource Sites

2.4.2.1 Shipping History

Submerged historical resources in the Study Area date back to Spanish occupation (1769–1821), through the Mexican period (1822–1846) and into this century. Explorer Juan Rodriguez Cabrillo in 1542 to 1543 made the earliest recorded exploration of this region. Vessel losses for the period have not been documented and are left to speculation by historians, who believe Cabrillo's ship *Victoria* may have grounded briefly at one of the islands. Manila galleons sailed through the area on their southern voyage from northern California to Mexico between 1565 and 1815. During this period at least 10 galleons were lost, their locations still unknown, with the possible exception of the *San Augustin* lost in 1595 in Drakes Bay near San Francisco. It was rumored a galleon was lost off Point Bennett, San Miguel Island, but this has not been substantiated. At the turn of the eighteenth century, ships engaged in the sea otter fur trade hunted at the Channel Islands and mainland coast near Santa Barbara. As the sea otter population became depleted, seals were then hunted for their furs (Morris and Lima 1996). Vessels in the hide and tallow trade frequently called at the Santa Barbara settlement to export the cargo. At least six vessels during the period 1819 to 1846 (pre-American occupation) were reported as lost in the Study Area.

2.4.2.2 Explanation of Vessel Losses

Table C-19 indicates a rise in the rate of casualties reported during the California Gold Rush period (1849 to 1856). This was based on an increase in steam and sailing vessel activity passing through the region and western expansion. Pre-Gold Rush (before 1849) records of casualties are more difficult to locate, therefore the representation of shipwrecks from this earlier period is less accurate.

Table C-19
Total Number of Vessel and Aircraft Casualties Reported Within the Study Area

	Total Loss	Non-Total Loss
1810 - 1819	2	0
1820 - 1829	0	2
1830 - 1839	1	0
1840 - 1849	4	0
1850 - 1859	8	0
1860 - 1869	2	0
1870 - 1879	11	0
1880 - 1889	9	3
1890 - 1899	16	0
1900 - 1909	18	4
1910 - 1919	19	11
1920 - 1929	31	35
1930 - 1939	31	17
1940 - 1949	80	7
1950 - 1959	44	9
1960 - 1969	64	4
1970 - 1979	52	7
1980 - 1989	103	9
1990 - 1999	77	7
2000 -	2	0
Total(s)	574	115

Notes: Listed by decade from 1810 to 2000. Does not include reported losses where no vessel or aircraft name was available.

The next increase in vessel losses occurred during the 1870s. This was attributed to the increase in commercial fisheries and the transportation of lumber products for building material to southern ports. Lumberyards were established in Santa Barbara, Ventura, and San Pedro during this period (Cox 1974). The expanding railway system also required lumber products that were shipped south from the lumber mills of northern California and the Pacific Northwest. The seagoing lumber trade in the Pacific is one of the most significant and long-lasting maritime economic developments, continuing well into the twentieth century (Gearhart *et al.* 1990). Vessels engaged in island commerce date back to nineteenth century sheep and cattle operations. Today, vessels still travel to the islands, providing public transportation for national park and sanctuary visitors, and employees of island operations.

American military vessels representing the U.S. Coast Survey (renamed the U.S. Coast and Geodetic Survey in 1878) and the Revenue Cutter Service (now the USCG) called at Santa Barbara during the 1850s. In 1849, the three-masted naval auxiliary steam bark *Edith*, en-route to Santa Barbara from Sausalito to transport representatives to the California State Constitutional Convention, was lost at San Antonio Creek, just north of Purisima Point (Schwemmer and Gamble 2000). The *Edith* represents the earliest American steam and naval vessel lost in the western United States and is located in the Study Area. The *Edith* was designed with an Ericsson telescoping propeller shaft; this shipwreck may provide the only surviving artifact of this kind (Nevitt 1941).

During the late nineteenth century, naval vessels frequently called at the ports of San Diego and San Francisco, transiting the nearshore waters between these ports. The protected waters of the Santa Barbara Channel were regularly used for sea trials by military vessels, as in the case of the battleship USS *Oregon* in 1896 (Tompkins 1966). From World War II to present, military aircraft from local bases on the mainland and offshore islands have been flown over the channel for training operations. Both military and civilian aircraft have been lost in the Study Area, including the recent Alaska Airlines crash in early 2000. Military vessel operations still continue in the Santa Barbara Channel, south of the Channel Islands and to the north of Point Conception. This region is currently part of the Naval Air Warfare Center Weapons Division, Point Mugu Sea Range (U.S. Navy 1999). The most recent shipwreck associated with these military operations was the stranding of the USS *Hostile Method 9* in 1999 at Government Point, just south of Point Conception.

In modern times, even with the advent of electronic navigational systems, there has been an increase in the number of casualties, mostly due to errors in judgment, uncharted hazards and unseaworthy vessels. These high numbers are also associated with an increase in recreational vessel use and a heightened awareness of reporting vessel losses by the USCG (Schwemmer and Gamble 2000). Although modern casualties do not represent historic resources, unless the vessel or aircraft was built over 50 years ago or had a unique design, each wreck still reflects the maritime historical landscape of this Study Area. Also, over time such wrecks could become of historic interest. Vessels lost in recent years may represent one-of-a-kind design features unique to this region, not unlike earlier island vessels designed and built for oceangoing cattle transportation. Military surplus vessels from the World War II era are still engaged in commercial coastal work and represent design features unique to a period more than 50 years ago.

2.4.2.3 Distribution of Submerged Historical Resource Sites

The number of shipwrecks and aircraft in the Study Area represents diverse historic resources (Table C-20). These craft were engaged in coastal, military, and in some cases, international trade. Shipwrecks can reflect transitions in construction methods and ship architecture, ranging, for example, from small wooden sloops to steel-hulled, fully rigged sailing vessels. The wooden-hull passenger steamer *Winfield Scott*, built in 1850, and the steel-hulled *Cuba*, built in 1897, are good examples of the evolution of steam propulsion and advancements in hull design over just a 47-year period. The *Winfield Scott* was powered

by two side-lever steam engines driving two paddle wheels, whereas the *Cuba* was powered by two triple-expansion engines driving two propellers. Both vessels were engaged in the passenger and cargo trade between Panama and San Francisco and both were owned by the Pacific Mail Steamship Company at the time of their loss (Schwemmer 2000b).

Table C-20
Historic Vessels in the CINMS

Name	<i>Aggi</i>	<i>Comet</i>	<i>Cuba</i>	<i>Goldenhorn</i>
Type	Steel full-rigged sail	Wooden schooner	Steel propeller	Iron bark sail
Built	1894	1886	1897	1883
Lost	1915	1911	1923	1892
Historic Theme	International grain trade	Lumber carrier	Cargo-passenger	Bulk cargo carrier
Gross Tonnage	1,898	429	3,168	1,914
Length*	265	144.6	308	268.6
Breadth*	39.1	35.2	42	40.2
Depth of Hold*	23.1	11.4	24.7	23.7

Note: *Dimensions in feet.

Artifacts located at submerged shipwreck sites, such as personal items or tools, provide valuable information about the crew and passengers who once sailed aboard these vessels. Further, shipwrecks can provide insight into the regional commerce of not only the Study Area, but sometimes, international trade (Terrell 1995). Documented submerged shipwrecks and aircraft can be pinpointed to a given day, providing optimal time capsules for archaeologists and historians to study. Submerged land use sites, such as landings, piers, and wharves, can provide historians with valuable information on the broader context of regional, national, and international commerce.

2.4.2.4 Shipwrecks of Historic Importance

Collectively and individually, certain land use sites, shipwrecks, and aircraft in the Study Area are of national historic significance. To date, however, the only two shipwrecks in the Study Area to be nominated and to receive a listing on the National Register of Historic Places (NRHP) are the California Gold Rush era side-wheel steamers *Winfield Scott* and *Yankee Blade* (Delgado 1992).

For a shipwreck to be eligible for listing, the vessel must be significant in American history, architecture, archaeology, engineering, or culture; and possess integrity of location, design, setting, materials, and workmanship. It may also evoke an aesthetic feeling of the past. The association of the vessel to its setting can also be important. The shipwreck should meet one or more of the four NRHP (2000) criteria:

1. Be associated with events that have made a significant contribution to the broad patterns of our history;
2. Be associated with the lives of persons significant in our past;
3. Embody the distinctive characteristics of a type, period, or method of construction, represent the work of a master, possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; and
4. Have yielded, or may be likely to yield, information important to prehistory or history.

Grouping shipwrecks into a Maritime District rather than as individual sites is another possibility. Maritime Districts make up a geographically definable area possessing a significant concentration, linkage, or continuity of maritime sites, buildings, structures, or objects united by past events or by plan or physical development (Delgado 1992).

The shipwrecks in the Sanctuary (Table C-20) may meet the criteria for listing on the NRHP.

The following accounts briefly describe the history of each ship and its historic importance:

Aggi: Mackie and Thomson built the three-masted full-rigged ship *Aggi* in 1894 at Glasgow, Scotland. This steel-hulled vessel was originally christened *Seerose*, which was later changed to *Sant' Erasmo*, then renamed *Apise*. At the time of loss, *Aggi* was owned by the Norwegian firm of B.A. Olsen and Son.

With a cargo of barley and beans, the *Aggi* departed San Francisco on April 29, 1915, under tow by the steamer *Edgar H. Vance*. En route for the Panama Canal to later sail on to Malmo, Sweden, the two vessels encountered a severe storm, which caused the towing hawser to part. The steamer limped back to San Francisco, leaving the *Aggi* on its own. The cargo shifted, putting the lee rails under water and submerging half the bunks in the forecastle. Although an effort was made to reach Santa Barbara, the vessel was unmanageable and struck Talcott Shoal, Santa Rosa Island. The remains of the *Aggi* lie at the top of the shoal and are scattered into deeper water.

National Register Consideration: The shipwreck site of the *Aggi* represents European advancements in the introduction of steel constructed sailing vessels over iron or wood, in the late nineteenth century. *Aggi's* final career represents this nation's international grain trade after the opening of the Panama Canal.

Comet: The three-masted lumber schooner *Comet* was built in 1886 at the Hall Brothers' shipbuilding firm at Port Blakely, Washington. It was built of Douglas fir with the exception of its hardwood stem- and sternposts, and had an elliptic stern and billet head. It was equipped with a centerboard and had one deck. Like many of its contemporaries, it was fitted with bow and stern ports for loading lumber. During the *Comet's* 25-year career, it delivered lumber to many coastal ports along the west coast (Russell 1996).

The *Comet* departed Aberdeen, Washington, destined for San Pedro, with its holds full and decks covered with a cargo of 500,000 board feet of lumber. On August 30, 1911, at 8:00 p.m., while sailing in heavy seas with a thick fog, the *Comet* struck Wilson Rock, 2.5 miles northwest of Harris Point, San Miguel Island. After the vessel struck the rock, it drifted with the current toward San Miguel Island. The crew lowered the sails to ease the strain, then grounded the schooner in Simonton Cove.

Today, the complete bow section of the *Comet* lies partly buried in the sand along the high tide line. The bow section is in a remarkable state of preservation and is possibly the only example of a Hall Brothers-built vessel (Schwemmer 2000a).

National Register Consideration: The *Comet's* hull design is unique to nineteenth-century Pacific Coast-built lumber schooners, with heavily-fastened, over-built construction of Douglas fir timbering, lumber loading ports, a beamy, shallow hull, and fore-and-aft rigging. The three-masted lumber schooner *C.A. Thayer* was also employed in the Pacific lumber trade and is now a floating historic vessel moored at the National Maritime Museum in San Francisco. Both the *Comet* and *C.A. Thayer* have similar design features, with the *Thayer* representing construction features of shipwright Hans Bendixsen at Fairhaven, California.

Cuba: The German-designed and built steamer *Cuba* was launched as the *Coblentz* at the Hamburg shipyard of Blohm and Voss on March 18, 1897. Blohm and Voss, which survived two world wars and is still in existence today, is recognized for building vessels such as the German battleship *Bismarck* and the sailing vessel *Horst Wessel*, now known as the USCG training ship *Eagle*. *Coblentz* was originally built for the Norddeutscher Lloyd of Bremen as an oceangoing passenger steamer and served this line until seized as a World War I prize in the Philippines. It was admitted to American registry under a joint resolution of Congress on May 12, 1917 and given the name *Sachem*. Pacific Mail Steamship Company purchased the *Sachem* and later changed its name to *Cuba*. Ultimately, the steamer was put on the Panama - San Francisco route. *Cuba's* power plant consisted of two triple-expansion steam engines, which delivered the relatively high revolutions required to drive the twin propellers (Schwemmer 2000b).

In the early morning darkness of September 8, 1923, the *Cuba* was northbound en route from the Panama Canal to San Francisco. In thick fog for 3 days, the ship navigated blindly up the coast, which led to its stranding on the treacherous reefs of Point Bennett, San Miguel Island. There was no loss of life. The passengers boarded lifeboats and were picked up by passing ships.

The shipwreck site offers an opportunity to study late nineteenth-century ship construction and propulsion design. The triple-expansion steam engines sit upright 14 feet off the sea floor, with the Scott boilers still positioned in front of the engines. The *Cuba* is the most compact and organized of all the major shipwrecks in the sanctuary, with much of its deck equipment in place (Morris and Lima 1996).

National Register Consideration: The shipwreck site of the *Cuba* represents vessels seized in World War I and put into American passenger and cargo service. The *Cuba's* builder, Blohm and Voss, is still internationally recognized for its achievements in the development of vessels, submarines, and aircraft.

Goldenhorn: The four-masted bark *Goldenhorn* was built for J.R. de Wolf and Son by Russell and Company of Greenock, Scotland, in 1883. The iron-hulled vessel was originally ship-rigged.

On the evening of September 12, 1892, the *Goldenhorn* was en route from Newcastle, New South Wales, Australia, to San Pedro, California, with coal destined for the Southern Pacific Railroad Company. Encountering thick fog off Santa Rosa Island, the bark was becalmed and driven ashore by a strong current and swell at 8:00 in the evening (Schwemmer 1999). The shipwreck scatter of the *Goldenhorn* lies off the southwest coast of Santa Rosa Island. Mapping of this site was started in 1985, and three separate scatters of wreckage were identified, including an 83-foot section of bottom hull (Morris and Lima 1996).

National Register Consideration: The shipwreck site of the *Goldenhorn* represents the European coal trade during America's railroad expansion in the late nineteenth century. Artifacts associated with the shipwreck *Goldenhorn* were used in the establishment of fishing camps during Chinese occupation of Santa Rosa Island.

Within the Study Area but outside Sanctuary boundaries lie a number of shipwrecks of historic significance (Table C-21). Several of these qualify for consideration on the NRHP. Collectively, shipwrecks in the vicinity of Point Pedernales could be included in a Maritime District.

Table C-21
Historic Vessels in the Study Area but Outside the Sanctuary

Name	<i>Edith</i>	<i>Gosford</i>	<i>USS McCulloch</i>
Type	Wooden aux. steamer	Wooden bark	Composite aux. steamer
Built	1844	1892	1897
Lost	1849	1893	1917
Historic Theme	Naval aux. steamer	Cargo: collier	Naval aux. steamer
Gross Tonnage	407	2,251	869
Length*	121	281.6	210
Breadth*	26.3	42.3	33.4
Depth of hold*	14	24.4	17.1

Note: *Dimensions in feet.

The following accounts briefly describe the history of each ship and its historic importance:

Edith: The three-masted auxiliary steamer bark *Edith* was built in 1844 by Samuel Hall, of East Boston, Massachusetts, for Robert Bennett Forbes. To augment its sail propulsion, it was powered by a John Ericsson-designed, Delamater Iron Works steam engine with a single propeller and shaft. The shaft penetrated the hull at one side of the sternpost. The propeller was carried on a pivoted bracket that could be swung sideways and upward to lift the propeller out of the water. It was built for the opium trade, which was legal then, but lay idle in China because the British underwriters refused to insure it, fearing that the heat from its furnaces would damage the opium. Consequently, the machinery was dismantled and the *Edith* sailed back to America, where the equipment was put back into working order. The *Edith* was purchased by the War Department and was engaged in transporting General Winfield Scott and his troops to the Mexican War (Nevitt 1941).

On March 3, 1849, under Congressional legislation, the *Edith* was transferred to the Department of the Navy and turned over to Commodore Thomas Catesby Jones, Commander-in-Chief of the Pacific Squadron at San Francisco. Lieutenant James McCormick was ordered on 16 June to report on the condition of the steamer. Subsequently, he was placed in command, with orders to transport representatives to the California State Constitutional Convention. En route from Sausalito to Santa Barbara, the *Edith* encountered dense fog on August 23, 1849, grounding south of Point Sal (U.S. Navy 1977).

National Register Future Consideration: Although the site of the *Edith* has not been located, contemporary research provides good documentation on its probable location. The site of the *Edith* would represent the oldest-known steamer and naval vessel to be lost on the west coast of America and may represent the only known Ericsson-designed telescoping propeller shaft.

Gosford: The shipyard of Scott & Company at Greenock, Scotland, built the four-masted, steel-hulled bark *Gosford* in 1892.

In November 1893, *Gosford* was en route from Birkenhead, England, to San Francisco with a cargo of coal. When it was about 300 miles off the California coast, its cargo erupted in fire, an event not uncommon with coal. According to Lloyd's Survey Handbook (1956), all classes of coal are liable to spontaneous combustion and therefore require adequate ventilation of holds. The crew made attempts to extinguish the fire without success as the *Gosford* neared Point Conception. The steam-schooner *Caspar* arrived on the scene and offered to take the bark in tow. Captain William Chatman accepted. The

Gosford was towed to Cojo Anchorage, just southeast of Point Conception. On November 22, 1893, even with other vessels arriving on the scene to render assistance, the *Gosford* succumbed to the fire and foundered at Cojo. Portions of the steel hull and some of its cargo of coal still exist at the site (Schwemmer and Gamble 2000).

National Register Consideration: The shipwreck site of the *Gosford* represents sailing vessels engaged as colliers in the international coal trade during the American industrial revolution.

USS *McCulloch*: This ship was built in 1897 by William Cramp and Sons of Philadelphia for the Revenue Cutter Service (now the USCG). It was ranked as a first-rate vessel in the Revenue Service in 1898. Its assigned status was “cooperating with Navy” (Revenue Cutter Service 1898). The *McCulloch* was originally rigged as a two-masted barkentine driven by a triple-expansion steam engine. Its composite steel hull was planked with wood. It was the largest revenue cutter of its time (Canney 1995).

The *McCulloch* was on its shakedown cruise at Malta when word was received that the *Maine* had been sunk in Havana Harbor, Cuba. The *McCulloch* was ordered to join Commodore Dewey’s Asiatic Squadron, then at Hong Kong. Its white hull was painted gray and additional guns were added. The *McCulloch* arrived at Manila Bay with other ships and silenced a Spanish shore battery. Commodore George Dewey had won a decisive victory, with no losses. As the *McCulloch* sailed for Hong Kong, news was received that the Spanish fleet had been destroyed (Gurney 1973). Transferred to the Navy on April 6, 1917, the *McCulloch* was assigned to patrol operations along the Pacific Coast (U.S. Navy 1969).

On June 13, 1917, the passenger steamer *Governor* was moving forward at a cautious speed through dense fog when its lookout discovered the approaching USS *McCulloch*. The *Governor*’s alarm was sounded just before the two vessels collided off Point Conception. The *Governor* struck the starboard bow of the *McCulloch*, making a large hole, which caused water to pour in so fast that the vessel sank in 35 minutes. The *Governor* took aboard the Navy crew of 110, including one sailor with serious injuries (*Los Angeles Times* 1917).

National Register Future Consideration: Remote sensing surveys of this region have identified the probable submerged site of the USS *McCulloch* (Hunter 1999). *McCulloch*’s naval career played a significant role in American history as part of Commodore George Dewey’s Asiatic Squadron.

3.0 APPENDIX C - REFERENCES

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APPENDIX D PROPOSED RULE

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

15 CFR Part 922

Docket No. 060222048-6048-01

RIN 0648-AT17

Channel Islands National Marine Sanctuary Regulations

AGENCY: National Marine Sanctuary Program (NMSP), National Ocean Service (NOS), National Oceanic and Atmospheric Administration (NOAA), Department of Commerce (DOC).

ACTION: Proposed rule; notice of public availability of draft management plan/draft environmental impact statement.

SUMMARY: The National Oceanic and Atmospheric Administration (NOAA) is proposing a revised management plan and a revised set of regulations for the Channel Islands National Marine Sanctuary (CINMS or Sanctuary). The proposed set of regulations includes both new regulations as well as changes to existing regulations. Proposed new regulations include prohibitions on: exploring for, developing, or producing minerals within the Sanctuary; abandoning matter on or in Sanctuary submerged lands; taking marine mammals, seabirds, or sea turtles within or above the Sanctuary; possessing within the Sanctuary any marine mammal, sea turtle, or seabird; marking, defacing, damaging, moving, removing, or tampering with Sanctuary signs, monuments, boundary markers, or similar items; introducing or otherwise releasing from within or into the Sanctuary an introduced species; and operating motorized personal watercraft within waters of the Channel Islands National Park. Proposed changes to existing regulations would clarify or refine: the coordinates and description of the Sanctuary's outer and shoreline boundaries; the inclusion of submerged lands within Sanctuary boundaries; the area in which altering submerged lands is prohibited; exceptions from the prohibition on discharging or depositing matter into the Sanctuary; the regulation on operating a vessel within one NM of any island within the Sanctuary; the regulation on moving, removing, or injuring a Sanctuary historical resource; exemptions for military activities; and permit issuance criteria and procedures. The revised regulations would also remove the exception for discharging or depositing meals on board vessels into the Sanctuary and include an additional prohibition on discharging and depositing any material or other matter from beyond the boundary of the Sanctuary that subsequently enters the Sanctuary and injures a Sanctuary resource or quality.

The NMSP is also proposing certain revisions to the Sanctuary's Designation Document. Proposed revisions of the Description of the Area would: clarify that the submerged lands at CINMS are legally part of the Sanctuary and are included in the boundary description, replace the term "seabed" with "submerged lands of the Sanctuary", and express boundary coordinates based on the North American Datum of 1983 (NAD 83). Proposed changes to the Scope of Regulations would authorize Sanctuary regulation of: exploring for, developing, or producing minerals within the Sanctuary; discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently

enters the Sanctuary and injures a Sanctuary resource or quality; placing or abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary; moving, injuring, possessing, or attempting to move, injure, or possess a Sanctuary historical resource; taking any marine mammal, sea turtle, or seabird within or above the Sanctuary; possessing within the Sanctuary any marine mammal, sea turtle, or seabird; marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary; and introducing or otherwise releasing from within or into the Sanctuary an introduced species. Additional proposed changes to the Designation Document would provide: an updated and more complete description of characteristics that give the Sanctuary particular value; greater clarity on the applicability of Sanctuary emergency regulations (and in keeping with the National Marine Sanctuary Program regulations of general applicability, 15 CFR Part 922, Subpart E); revision of the Scope of Regulations section on consistency with international law with language taken directly from sec. 305(a) of the National Marine Sanctuaries Act (NMSA), which deals with application of regulations; an updated explanation of the effect of Sanctuary authority on preexisting leases, permits, licenses, and rights; an update of the section entitled Alterations to This Designation to reflect the NMSA as currently written; and occasional wording fine-tuning in order to conform wording of the Designation Document, where appropriate, to wording used for more recently designated sanctuaries. No changes are proposed to be made to the "Fishing" and "Defense Activities" sections within Article V (Relation to Other Regulatory Programs) of the Designation Document.

DATES:

NOAA is publishing this proposed rule to provide notice to the public and invite advice, recommendations, information, and other comments from interested parties on the proposed rule and Draft Management Plan/Draft Environmental Impact Statement (DMP/DEIS). Public hearings will be held as detailed below:

- (1) Tuesday, June 27, 2006, at the Sheraton Four Points hotel, San Buenaventura Ballroom, 1050 Schooner Drive, in Ventura, California.
- (2) Thursday, June 29, 2006, at the Earl Warren Showgrounds, Warren Hall, 3400 Calle Real Street, in Santa Barbara, California.

Comments will be considered if received by July 21, 2006.

ADDRESSES: Copies of the DMP/DEIS are available at Channel Islands National Marine Sanctuary, 113 Harbor Way, Suite 150, Santa Barbara, California and on the web at <http://channelislands.noaa.gov>. You may submit comments, identified by RIN 0648-AT17, by any of the following methods:

- E-mail: cinms.mgtplan@noaa.gov.
- Fax: (805) 568-1582.
- Mail: Chris Mobley, Superintendent, Channel Islands National Marine Sanctuary, 113 Harbor Way, Suite 150, Santa Barbara, California, 93109.
- Hand Delivery / Courier: Channel Islands National Marine Sanctuary, 113 Harbor Way, Suite 150, Santa Barbara, California, 93109.

FOR FURTHER INFORMATION CONTACT: Michael Murray at (805) 884-1464 or michael.murray@noaa.gov.

SUPPLEMENTARY INFORMATION:

Introduction

Pursuant to section 304(e) of the NMSA, 16 U.S.C. 1431 et seq. the National Marine Sanctuary Program (NMSP) conducted a review of the management plan and regulations for the Channel Islands National Marine Sanctuary (CINMS or Sanctuary), located off the coast of southern California. The review has resulted in a proposed new management plan for the Sanctuary, some proposed changes to existing regulations, and some proposed new regulations. The proposed new regulations include prohibitions on:

- exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to authorized hydrocarbon production;
- abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary;
- taking any marine mammal, sea turtle, or seabird within or above the Sanctuary, except as expressly authorized by the Marine Mammal Protection Act, as amended, (MMPA), 16 U.S.C. 1361 et seq., Endangered Species Act, as amended, (ESA), 16 U.S.C. 1531 et seq., Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. 703 et seq., or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA.
- possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as expressly authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA;
- marking, defacing, damaging, moving, removing, or tampering with any sign, notice or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary;
- introducing or otherwise releasing from within or into the Sanctuary an introduced species, except striped bass (*Roccus saxatilis*) released during catch and release fishing activity; and
- operating a motorized personal watercraft (MPWC) within waters of the Channel Islands National Park.

These measures would afford better protection to the natural and cultural resources of CINMS.

Existing regulations would also be revised to:

- clarify that Sanctuary boundaries encompass the submerged lands;
- correct some inaccuracies and ambiguities in the coordinates and description of the Sanctuary's outer and shoreline boundaries;
- remove outdated and unnecessary oil spill contingency equipment requirements;
- clarify that discharges allowed from marine sanitation devices apply only to Type I and Type II marine sanitation devices;
- provide an exemption for discharges by vessels of the Armed Forces allowed under section 312(n) of the Federal Water Pollution Control Act, as amended, (uniform national discharge standards for vessels of the Armed Forces);
- specify that the existing exception for discharging or depositing fish, fish parts, or chumming materials (bait) applies only to such discharge or deposit during the conduct of lawful fishing activity within the Sanctuary;
- remove an exception for discharging or depositing meals on board vessels;
- prohibit discharges or deposits of any material or other matter from beyond the boundary of the Sanctuary that subsequently enters the Sanctuary and injures a Sanctuary resource or quality;

- extend from 2 NM to the outer Sanctuary boundary (approximately 6 NM) the existing prohibition on alteration of the submerged lands of the Sanctuary;
- prohibit not just vessels engaged in the trade of carrying cargo and vessels engaged in the trade of servicing offshore installations, but also vessels of 300 gross registered tons or more (excluding fishing and kelp harvesting vessels) from operating within 1 NM of any island;
- revise and strengthen the existing protection of cultural resources to prohibit moving, possessing, injuring, or attempting to move, remove, injure, or possess any Sanctuary historical resource;
- clarify, update, and refine the regulation of Department of Defense activities occurring within the Sanctuary to, among other things, provide more consistency with the NMSA (as it now reads); and
- conform wording, where appropriate, to wording used for more recently designated sanctuaries.

The permit regulations for the Sanctuary are also being revised and clarified. Activities that assist in Sanctuary management or further salvage or recovery operations for certain abandoned shipwrecks would be added to the list of activities for which the Director of the NMSP (Director), or designee, may issue a permit. The modified permit regulations also specify that the Director may only issue permits for specific activities that would otherwise (without a permit) violate certain prohibitions: discharging and depositing; altering the submerged lands; abandoning (structures, material or other matter on the submerged lands); nearshore operation of vessels; disturbing a seabird or marine mammal by aircraft overflight below 1000 feet within 1 NM of the Islands; moving, removing, injuring or possessing, or attempting to move, remove, injure or possess a Sanctuary historical resource; taking any marine mammal, sea turtle or seabird within or above the Sanctuary; possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird; and operating a MPWC within waters of the Channel Islands National Park. In deciding whether to issue a permit, the Director of the NMSP would be required to consider the proposed activity in terms of: duration; effects on Sanctuary resources and qualities; potential indirect, secondary, or cumulative effects; and whether it is necessary to conduct the activity in the Sanctuary. In addition, the proposed modifications to the permit procedures and criteria (15 CFR 922.72) would further refine current requirements and procedures found in the general NMSP regulations (15 CFR 922.48(a) and (c)). The proposed modifications would also clarify existing requirements for permit applications found in the Office of Management and Budget approved applicant guidelines (OMB Control Number 0648-0141). The proposed modifications to the permit regulations would also expressly require that the permittee agree to hold the United States harmless against any claims arising out of the permitted activities.

The proposed revised management plan for the Sanctuary contains a series of action plans that outline management, research, education, operational, and performance measurement activities planned for the next five years. The activities are designed to address specific issues facing the Sanctuary and, in doing so, help achieve the mandates of the NMSP and the Sanctuary's designation.

This document publishes the proposed new regulations and the proposed changes to existing regulations, publishes the text of the proposed Revised Designation Document for the Sanctuary, and announces the availability of the draft management plan and the draft environmental impact statement (DMP/DEIS). The existing CINMS Designation Document was published in 1980 upon establishment of the Sanctuary and, per the NMSA (at 16 U.S.C. 1434(a)(4)), describes the geographic area proposed to be included within the Sanctuary, the characteristics of the area that give it conservation, recreational, ecological, historical, research, educational, or esthetic value, and the types of activities that will be subject to regulation by the Secretary to protect those characteristics. The NMSP is proposing certain revisions to the Sanctuary's Designation Document, which include changes to the description of the area, an updated and more accurate description of characteristics that give the Sanctuary particular value, an updated

explanation of the relation to other regulatory programs, and a number of substantive changes to the Sanctuary's scope of regulations.

Since designation, the area of CINMS has been described as approximately 1252.5 square nautical miles (NM). However, as a result of the proposed regulation changes that correct inaccuracies and ambiguities in the coordinates and the description of the Sanctuary's outer and shoreline boundaries, the CINMS area is now calculated as approximately 1243 square NM. The legal description of CINMS is proposed to be updated to reflect this change. This update would not constitute a change in the geographic area of the Sanctuary but rather an improvement in the estimate of its size.

Because this proposed action includes changes to the terms of designation of the Sanctuary, as defined at 16 U.S.C. 1434(a)(4), as required by 16 U.S.C. 1434(a)(2), a DEIS has been developed consistent with the National Environmental Policy Act of 1969.

Marine Reserves and Conservation Areas

In 2002 NOAA considered merging environmental review processes for consideration of establishing marine reserves (no-take zones) and/or marine conservation areas (limited-take zones) within the Sanctuary, and the management plan revision, but subsequently decided to proceed with two separate processes. Consequently, a separate DEIS and draft proposed rule are being prepared to address consideration of marine reserves and conservation areas. As such, the consideration of marine reserves and conservation areas is outside the scope of this proposed rule. No part of this proposed rule directs or influences a future decision on the separate process to consider establishing marine reserves and conservation areas within the Sanctuary.

Sanctuary Environment

Designated on October 2, 1980 (45 FR 65200), the Sanctuary consists of an area off the coast of California of approximately 1243 square NM adjacent to the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (the Islands) extending seaward to a distance of approximately six NM. The Sanctuary is located within the upper portion of the Southern California Bight (SCB), which is formed by a transition in the California coastline wherein the north-south trending coast begins to trend east to west. The SCB stretches from Point Conception in the north to Punta Eugenia (Mexico) in the south. Due to the oceanographic features of the SCB, its three bioregions, and the complex bottom topography and diversity of habitats found at the Islands, the Sanctuary has a great diversity of marine life.

The Sanctuary is located within a 300-mile long oceanographic region known as the Continental Borderland, a unique region of the continental shelf characterized by basins and elevated ridges. The California Current, the major ocean current moving through the region, transports cold water southward from upwelling centers along the coast. Point Conception, on the mainland coast north of San Miguel Island, is the southernmost major upwelling center on the west coast of the United States. This upwelling results in increased primary productivity and large zooplankton populations that support exceptionally abundant populations of small schooling fish. The Southern California Countercurrent transports warm water northward from the U.S.-Mexico border into the Santa Barbara Channel. Point Conception marks a transition zone between these cool surface waters to the north and warm waters to the south. The confluence of the California Current and Southern California Countercurrent creates three distinct bioregions in and around the Sanctuary: 1) the cold Oregonian Province; 2) the warm California Province; and 3) the transition zone between the two. These bioregions often overlap within the Sanctuary, resulting in a unique and highly diverse array of marine life including cold water species at the southern end of their range and warm water species at the northern end of their range.

Numerous important habitats are represented within the Sanctuary including kelp forests, surfgrass and eelgrass, intertidal, nearshore subtidal, deep-water benthic, and pelagic habitats. Giant kelp beds are highly productive Sanctuary habitats that provide food, shelter, attachment sites, and nursery habitat for myriad invertebrates and fishes. Greater habitat heterogeneity within the Sanctuary has resulted in increased kelp forest species diversity compared to that of mainland kelp forests. The extent of kelp beds varies considerably based on environmental conditions such as water temperature and natural predation. Surfgrass and eelgrass beds are also highly productive and complex microhabitats that support a wide variety of marine species. Intertidal habitat within the Sanctuary is composed of approximately 94.5 miles of rocky coastline interspersed with approximately 47 miles of sandy beaches. Rocky shores support a rich assortment of plants and animals, including numerous green, brown, and red algae, as well as beds of surfgrass. Nearshore subtidal habitats include mud, sand, gravel, cobble, and bedrock substrates. Rocky nearshore subtidal habitats are widespread, especially high relief volcanic reefs with walls, ledges, caves, and pinnacles. Typical shallow subtidal areas in the Sanctuary contain assemblages of plants, invertebrates, and fishes, with giant kelp dominating. Many shallow reefs grazed by sea urchins have less giant kelp and greatly reduced species diversity. Deeper reefs have well-developed invertebrate cover. Deep-water benthic or bottom habitats in the Sanctuary are 90% fine sediment or clay, with the remainder consisting of rocky areas. High relief pinnacles and ridges occur off the northwest end of San Miguel Island. While offshore benthic habitats do not support marine plants, they do support numerous invertebrates and demersal fishes such as various species of rockfish. Pelagic habitat, within the water column, supports numerous marine plants, fishes, and invertebrates, including plankton.

Diversity of marine plants is greater in the SCB, which includes the Sanctuary, as indicated above, than along coastal central California. In the SCB, there are at least 492 species of algae and 4 species of seagrasses known to occur of the 673 species described for California.

The total number of invertebrate species in the SCB is estimated at more than 5,000, not including microinvertebrates. Select invertebrates in the Sanctuary include many species of corals, prawns, spiny lobster, crabs, sea urchins, sea cucumbers, sea star, abalone, nudibranchs, scallops, mussels, squid, clams, barnacles, snails, salps, tunicates, jellyfish, sea slugs, and anemones. White abalone is protected by the Endangered Species Act.

About 481 species of fish inhabit the SCB. Abundance of fish assemblages is greater surrounding the Islands than at nearby coastal regions of the southern California mainland. Select fishes commonly found in the Sanctuary include: albacore, anchovy (northern), bass (various species), cabezon, California sheephead, California halibut, garibaldi, rockfish (various species), salmon (king), sardine (Pacific), shark (various species), surfperch (various species), swordfish, and white sea bass.

Four species of sea turtles have been reported in the offshore southern California region: green, loggerhead, olive Ridley, and leatherback. Southern California sea turtle stranding data indicate that all four species of sea turtle found in the region may be found within the Sanctuary at any time of year. All sea turtles are protected by the Endangered Species Act.

Over 195 species of birds use open water, shore, or island habitats in the SCB. The Sanctuary provides stopover habitat during both northern and southern bird migrations along the Pacific Flyway. The Sanctuary provides important habitat for eight seabirds that have special status under federal or state law: ashy storm-petrel, black storm-petrel, California brown pelican, California least tern, double-crested cormorant, rhinoceros auklet, western snowy plover, and Xantus' murrelet.

There are three marine mammal groups in the Sanctuary: whales, dolphins, and porpoises (cetaceans); seals and sea lions (pinnipeds); and the southern sea otter. All marine mammals are protected under the

Marine Mammal Protection Act of 1972. In addition, some marine mammals are protected under both the federal and state endangered species acts. At least 33 species of cetaceans have been reported in the Sanctuary region. Species commonly found in the Sanctuary include: long-beaked common dolphin, short-beaked common dolphin, bottlenose dolphin, Pacific white-sided dolphin, northern right whale dolphin, Risso's dolphin, California gray whale, blue whale, and humpback whale. Seven species of pinnipeds are found throughout or in part of the Sanctuary: the California sea lion (common), northern fur seal (uncommon), northern elephant seal (common), Pacific harbor seal (common), Guadalupe fur seal (extremely rare), Steller sea lion (rare), and ribbon seal (rare). The Sanctuary provides vital pinniped habitat including important feeding areas, breeding sites, and haul outs. Sea otters were common around the Islands until prolonged periods of hunting led to local extinction at the Islands and severe depletion along the mainland California coast. Rare sightings of sea otters in the Sanctuary have been reported since the 1987-to-1990 U.S. Fish and Wildlife Service (USFWS) translocation of 139 sea otters to San Nicolas Island. The southern sea otter is listed as threatened under the Endangered Species Act.

The ecological and cultural values of the Islands and surrounding waters are recognized nationally and internationally by several special designations, including that as a national marine sanctuary. In 1980 the United States not only designated the Sanctuary, but also designated Anacapa, San Miguel, Santa Barbara, Santa Cruz, and Santa Rosa Islands and 125,000 acres of submerged lands surrounding them as the Channel Islands National Park. In addition, the United Nations Educational, Scientific and Cultural Organization's (UNESCO) Man and the Biosphere Program designated the Sanctuary as a Biosphere Reserve in 1986.

The Sanctuary's cultural values stem largely from its rich array of maritime heritage resources (shipwrecks, aircraft wrecks, material associated with wharves, piers and landings, prehistoric archaeological sites and their associated artifacts, and paleontological remains). Carbon dating indicates that humans were present at the Islands as early as 13,000 years ago, with a site on Santa Rosa Island presenting the oldest human remains yet discovered in North America. The Islands and surrounding Sanctuary contain an abundance of prehistoric Native American Chumash artifacts and are still revered as a homeland by Chumash descendants. Historical remains may exist from as early as Juan Rodriguez Cabrillo's European voyage of discovery (1542 to 1543) through modern times. Known historical remains are represented in an inventory of over 140 shipwrecks and aircraft wrecks documented in the Sanctuary since 1853.

The uniqueness of the Sanctuary region and its proximity to several major ports and harbors along the mainland coast has made it a popular destination for numerous recreational and commercial activities. Sportfishing, diving, snorkeling, whale watching, pleasure boating, kayaking, surfing, and sightseeing are all popular pastimes within the Sanctuary, which is often referred to as "the Galapagos of the north." In 1999, recreation and tourism businesses represented almost 480 thousand person-days of activity within the Sanctuary. The Sanctuary also has very productive commercial fishing grounds. Key commercially targeted species include: squid, sea urchin, spiny lobster, prawn, nearshore and offshore finfishes, coastal pelagic species, flatfishes, rock crab, sea cucumber, tuna, and kelp. Of these market squid, sea urchin, spiny lobster, and halibut are the most economically valuable. In 1999 the ex-vessel value of species commercially caught within the Sanctuary was approximately \$42,777,444. Other human uses that occur adjacent to and in the Sanctuary are oil and gas activities, shipping, Department of Defense and Department of Homeland Security activities, and scientific research and education.

The Sanctuary is located near an area of southern California coastline that has experienced a dramatic increase in population. Whereas the population of southern California (Imperial, Los Angeles, Orange, Riverside, San Bernardino, San Diego, Santa Barbara, and Ventura counties) was approximately 13.5 million in 1980, population levels now reach nearly 20 million. This represents a regional increase in

population of approximately 43%. Aerial and on-water surveys indicate that visitation to CINMS has increased significantly since 1980. With continued technological innovations such as global positioning systems (GPS) and improved watercraft design, it is likely that there will be continued increasing visitation to the Sanctuary and added pressure on its resources. With its proposed revised management plan and regulations, NOAA hopes to continue to protect CINMS for continued appreciation and appropriate use by current and future generations.

Proposed Revised Designation Document

The Designation Document for the Sanctuary contains the terms of designation as defined in the NMSA (16 U.S.C. 1434(a)(4)). NOAA is proposing some changes to the Designation Document as part of this management plan review process. Specifically, NOAA is proposing to clarify in the Designation Document that the submerged lands at CINMS are legally part of the Sanctuary and are included in the boundary description. At the time the Sanctuary was designated in 1980, Title III of the Marine Protection, Research, and Sanctuaries Act (now known as the NMSA) characterized national marine sanctuaries as consisting of coastal and ocean waters but did not expressly mention submerged lands thereunder. NOAA has consistently interpreted its authority under the NMSA as extending to submerged lands, and amendments to the NMSA in 1984 (Pub. L. 98-498) clarified that submerged lands may be designated by the Secretary of Commerce as part of a national marine sanctuary (16 U.S.C. 1432(3)). Therefore, NOAA is updating the Designation Document and the boundary description, and is also replacing the term “seabed” with “submerged lands of the Sanctuary.” In addition, boundary coordinates in the revised Designation Document and in the Sanctuary regulations would be expressed by coordinates based on the North American Datum of 1983 (NAD 83). Since designation the area of CINMS has been described as approximately 1252.5 square NM. However, adjusting for technical corrections and using updated technologies, the CINMS area is now calculated as approximately 1243 square NM. The legal description of CINMS is proposed to be updated to reflect this change. This update would not constitute a change in the geographic area of the Sanctuary but rather an improvement in the estimate of its size.

The Designation Document is also proposed to be modified to authorize Sanctuary regulation of: exploring for, developing, or producing minerals within the Sanctuary; discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality; placing or abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary; moving, injuring, possessing, or attempting to move, injure, or possess a Sanctuary historical resource; taking any marine mammal, sea turtle, or seabird within or above the Sanctuary; possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle or seabird; marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary; and introducing or otherwise releasing from within or into the Sanctuary an introduced species. These proposed revisions to and addition of new activities subject to Sanctuary regulation would enable new and emerging resource management issues to be addressed, and are necessary in order to ensure the protection, preservation, and management of the conservation, recreational, ecological, historical, cultural, educational, archeological, scientific, and esthetic resources and qualities of the Sanctuary.

Additional proposed changes to the Designation Document would provide: an updated and more complete description of characteristics that give the Sanctuary particular value; greater clarity on the applicability of Sanctuary emergency regulations (in keeping with the National Marine Sanctuary Program regulations of general applicability, 15 CFR Part 922, Subpart E); revision of the Scope of Regulations section on consistency with international law with language taken directly from sec. 305(a) of the NMSA, which deals with application of regulations; an updated explanation of the effect of Sanctuary authority on

preexisting leases, permits, licenses, and rights; an update of the section entitled Alterations to This Designation to reflect the NMSA as currently written; and occasional wording fine-tuning in order to conform wording of the Designation Document, where appropriate, to wording used for more recently designated sanctuaries. No changes are proposed to be made to the “Fishing” and “Defense Activities” sections within Article V (Relation to Other Regulatory Programs) of the Designation Document.

The NMSP has carefully considered existing state and federal authorities in proposing new regulatory authorities to ensure protection and management of sanctuary resources. Proposed new authorities are intended to complement existing authorities.

Proposed Revised Designation Document for the Channel Islands National Marine Sanctuary

Article I. Effect of Designation

The Channel Islands National Marine Sanctuary was designated on October 2, 1980 (45 FR 65200). Section 308 of the National Marine Sanctuaries Act, 16 U.S.C. 1431 et seq., (NMSA) authorizes the issuance of such regulations as may be necessary to implement the designation, including managing, protecting and preserving the conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, and esthetic resources and qualities of the Channel Islands National Marine Sanctuary (Sanctuary). Section 1 of Article IV of this Designation Document lists activities of the types that either are to be regulated on the effective date of designation or may be regulated at some later date in order to protect Sanctuary resources and qualities. Listing does not necessarily mean that a type of activity will be regulated; however, if a type of activity is not listed it may not be regulated, except on an emergency basis, unless Section 1 of Article IV is amended to include the type of activity by the same procedures by which the original designation was made.

Article II. Description of the Area

The Sanctuary consists of an area of approximately 1243 square nautical miles (NM) of coastal and ocean waters, and the submerged lands thereunder, off the southern coast of California. The Sanctuary boundary begins at the Mean High Water Line of and extends seaward to a distance of approximately six NM from the following islands and offshore rocks: San Miguel Island, Santa Cruz Island, Santa Rosa Island, Anacapa Island, Santa Barbara Island, Richardson Rock, and Castle Rock (the Islands). The seaward boundary coordinates are listed in the Appendix to this Designation Document.

Article III. Characteristics of the Area That Give It Particular Value

The Islands and surrounding ecosystems are unique and highly valued, as demonstrated by, for example, several national and international designations. The Islands and surrounding ecosystems are characterized by a unique combination of features including: complex oceanography, varied bathymetry, diverse habitats, remarkable biodiversity, rich maritime heritage, remote yet accessible location, and relative lack of development. These features yield high existence values as well as human use values for research, education, recreation, and commerce.

The Islands are located within a 300-mile long oceanographic region known as the Continental Borderland, a unique region of the continental shelf characterized by basins and elevated ridges. Within this region the confluence of the cool California Current and warm Southern California Countercurrent creates three distinct bioregions in and around the Sanctuary: the cold Oregonian Province, the warm California Province, and the transition zone between the two. The overlap of these bioregions results in a unique and highly diverse array of marine life within the Sanctuary, including cold water species at the southern end of their range and warm water species at the northern end of their range. In addition, the Sanctuary is located offshore from Point Conception, the southernmost major upwelling center on the west coast of the United States. Upwelling yields increased primary productivity essential to the marine

food web.

Diverse bathymetry and habitats are also important and unique characteristics of the Islands and surrounding ecosystems. The Sanctuary contains many important and varied physical and geological features including a complex of plateaus, continental slope, gyres, banks, subsea canyons, and rocky reefs. The diversity of accentuated bottom relief, abrupt change in depth, and varied substrate provide a spectrum of marine habitats. Some of the key marine habitats are sandy beach, rocky intertidal, kelp forest, rocky reef, and sandy bottom.

The Sanctuary's oceanographic and physical features support a great diversity of marine species, many of which are extremely rare and afforded special protection by federal and state law. At least 33 species of cetaceans are found within the Sanctuary, including blue, gray, and humpback whales and numerous dolphin species. While historically seven species of pinnipeds have been found throughout or in part of the Sanctuary, at least four species maintain important rookery and/or haul out sites on the Islands. Following the 1987 to 1990 translocation of southern sea otters to San Nicolas Island, rare sea otter sightings have been reported in the Sanctuary. Over 60 species of seabird occur within the Sanctuary, eleven of which utilize breeding habitat at the Islands. In addition, over 400 species of fish and more than 5,000 species of invertebrates are found in the Sanctuary. Stranding data indicate that green, loggerhead, olive Ridley, and leatherback sea turtles may also be found within the Sanctuary. Finally, numerous marine algae and plant species occur within the Sanctuary, the most notable among these being giant kelp and eelgrass.

The quality and abundance of natural resources at the Islands and surrounding waters have attracted man from the earliest prehistoric times to the present. As a result, the Sanctuary contains significant prehistoric and historic maritime heritage resources. Prehistoric maritime heritage resources include submerged Native American sites, the significance of which is underscored by a terrestrial Islands site with human remains dated to 13,000 years ago, the oldest human remains yet discovered in North America. Maritime heritage resources date back as far as 1542 and include over 140 historic shipwreck and aircraft sites. These wrecks reveal the diverse range of activities and nationalities that have traversed the Santa Barbara Channel. Following the mission era human occupation of the Islands transitioned from significant Chumash Native American villages, to land grant and ranching settlements, and finally to joint public-private ownership and management aimed at resource conservation and compatible public use. Modern-day descendants of the Chumash people still value and enjoy the Islands and surrounding Sanctuary waters, and work to keep preserve aspects of Chumash cultural history and practices. Despite this long history of human presence on the Islands, they remain remote yet accessible, and undeveloped relative to the burgeoning populations of nearby mainland southern California.

The physical, biological, and cultural characteristics of the Sanctuary combine to provide outstanding opportunities for appropriate scientific research, education, recreation, commerce, and natural and maritime heritage resource protection, preservation, and management. The Islands and surrounding Sanctuary are the subject of extensive research, primarily in the following categories: physical and biological science research; socioeconomic, cultural, and historic research; and political science research. Since its designation in 1980 the Sanctuary has played an important role in marine science education for all ages on a local, regional, national, and international scale. Popular Sanctuary recreation activities include wildlife viewing, boating, sailing, kayaking, diving, and sportfishing. Commercial activities within the Sanctuary include maritime shipping, oil and gas activities (two leases pre-date the Sanctuary), kelp harvesting, and commercial fishing. Some of the state's most valuable commercial fisheries occur within the Sanctuary. A complex web of county, state, and federal agencies manages the resources of the Islands and surrounding area and human uses thereof.

Several special designations recognize the Islands' and surrounding ecosystems' unique value. In 1980 the United States designated both the Channel Islands National Marine Sanctuary, as well as the islands of Anacapa, San Miguel, Santa Barbara, Santa Cruz, and Santa Rosa and 125,000 acres of submerged lands surrounding them as the Channel Islands National Park. In addition, the United Nations Educational, Scientific and Cultural Organization's (UNESCO) Man and the Biosphere Program designated the Sanctuary as a Biosphere Reserve in 1986.

Article IV. Scope of Regulations

Section 1. Activities Subject to Regulation

The following activities are subject to regulation, including prohibition, as may be necessary to ensure the management, protection, and preservation of the conservation, recreational, ecological, historical, cultural, archeological, scientific, educational, and esthetic resources and qualities of this area:

- a. Exploring for, developing, or producing hydrocarbons or minerals within the Sanctuary;
- b. Discharging or depositing from within or into the Sanctuary any material or other matter;
- c. Discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality;
- d. Drilling into, dredging, or otherwise altering the submerged lands of the Sanctuary; or constructing, placing, or abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary;
- e. Operating a vessel (i.e., watercraft of any description) within the Sanctuary except fishing vessels or vessels traveling within a Vessel Traffic Separation Scheme or Port Access Route designated by the Coast Guard outside of 1 NM from any Island;
- f. Disturbing a marine mammal or seabird by an overflight below 1000 feet;
- g. Moving, removing, injuring, possessing, or attempting to move, remove, injure, or possess a Sanctuary historical resource;
- h. Taking any marine mammal, sea turtle, or seabird within or above the Sanctuary;
- i. Possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird;
- j. Marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary;
- k. Introducing or otherwise releasing from within or into the Sanctuary an introduced species.

Section 2. Consistency with International Law

The regulations governing the activities listed in Section 1 of this article shall be applied in accordance with generally recognized principles of international law, and in accordance with treaties, conventions, and other agreements to which the United States is a party. No regulation shall apply to or be enforced against a person who is not a citizen, national, or resident alien of the United States, unless in accordance with: generally recognized principles of international law; an agreement between the United States and the foreign state of which the person is a citizen; or an agreement between the United States and the flag state of a foreign vessel, if the person is a crewmember of the vessel.

Section 3. Emergency Regulations

Where necessary to prevent or minimize the destruction of, loss of, or injury to a Sanctuary resource or quality, or minimize the imminent risk of such destruction, loss, or injury, any and all activities, including those not listed in section 1 of this Article, are subject to immediate temporary regulation, including prohibition, consistent with the Administrative Procedure Act.

Article V. Relation to Other Regulatory Programs

Section 1. Fishing

The regulation of fishing is not authorized under Article IV. However, fishing vessels may be regulated with respect to discharges in accordance with Article IV, Section 1, paragraphs (b) and (c) and aircraft conducting kelp bed surveys below 1000 feet can be regulated in accordance with Article IV, Section 1, paragraph (f). All regulatory programs pertaining to fishing, including particularly regulations promulgated under the California Fish and Game Code and Fishery Management Plans promulgated under the Magnuson-Stevens Fishery Conservation and Management Act, 16 U.S.C. 1801 et seq., shall remain in effect. All permits, licenses and other authorizations issued pursuant thereto shall be valid within the Sanctuary unless authorizing any activity prohibited by any regulation implementing Article IV. Fishing as used in this article and in Article IV includes kelp harvesting.

Section 2. Defense Activities

The regulation of those activities listed in Article IV shall not prohibit any activity conducted by the Department of Defense that is essential for national defense or because of an emergency. Such activities shall be consistent with the regulations to the maximum extent practicable.

Section 3. Effect on Leases, Permits, Licenses, and Rights

Pursuant to section 304(c) of the NMSA, 16 U.S.C. 1434(c), no valid lease, permit, license, approval, or other authorization issued by any federal, state, or local authority of competent jurisdiction, or any right of subsistence use or access, may be terminated by the Secretary of Commerce or designee as a result of this designation or as a result of any Sanctuary regulation if such authorization or right was in existence on the effective date of this designation. The Secretary of Commerce, or designee, however, may regulate the exercise (including, but not limited to, the imposition of terms and conditions) of such authorization or right consistent with the purposes for which the Sanctuary is designated.

Article VI. Alterations to This Designation

The terms of designation, as defined under section 304(a) of the NMSA, may be modified only by the same procedures by which the original designation is made, including public hearings, consultation with interested federal and state agencies and the Pacific Fishery Management Council, approved by the Secretary of Commerce or designee, and after the close of a review period of forty-five days of continuous session of Congress.

Appendix -- Channel Islands National Marine Sanctuary Boundary Coordinates

Coordinates listed in this Appendix are unprojected (Geographic) and based on the North American Datum of 1983.

Point ID #	Lat. North	Long. West
1	33.94138	-119.27422
2	33.96776	-119.25010
3	34.02607	-119.23642
4	34.07339	-119.25686
5	34.10185	-119.29178
6	34.11523	-119.33040
7	34.11611	-119.39120
8	34.11434	-119.40212
9	34.11712	-119.42896
10	34.11664	-119.44844
11	34.13389	-119.48081

Point ID #	Lat. North	Long. West
12	34.13825	-119.49198
13	34.14784	-119.51194
14	34.15466	-119.59059
15	34.15142	-119.61254
16	34.13411	-119.66024
17	34.14635	-119.69780
18	34.15988	-119.76688
19	34.15906	-119.77800
20	34.15928	-119.79327
21	34.16213	-119.80347
22	34.16962	-119.83643

Point ID #	Lat. North	Long. West
23	34.17266	-119.85240
24	34.17588	-119.88903
25	34.17682	-119.93357
26	34.17258	-119.95830
27	34.13535	-120.01964
28	34.13698	-120.04206
29	34.12994	-120.08582
30	34.12481	-120.11104
31	34.12519	-120.16076
32	34.11008	-120.21190
33	34.11128	-120.22707
34	34.13632	-120.25292
35	34.15341	-120.28627
36	34.16408	-120.29310
37	34.18231	-120.31224
38	34.19117	-120.32576
39	34.20224	-120.35122
40	34.20707	-120.41801
41	34.20520	-120.42859
42	34.19254	-120.46041
43	34.20540	-120.50728
44	34.20486	-120.53987
45	34.18182	-120.60041
46	34.10208	-120.64208
47	34.08151	-120.63894
48	34.05848	-120.62862
49	34.01940	-120.58567
50	34.01349	-120.57464
51	33.98698	-120.56582
52	33.95039	-120.53282
53	33.92694	-120.46132
54	33.92501	-120.42170
55	33.91403	-120.37585
56	33.91712	-120.32506
57	33.90956	-120.30857
58	33.88976	-120.29540
59	33.84444	-120.25482
60	33.83146	-120.22927
61	33.81763	-120.20284
62	33.81003	-120.18731
63	33.79425	-120.13422
64	33.79379	-120.10207
65	33.79983	-120.06995
66	33.81076	-120.04351
67	33.81450	-120.03158
68	33.84125	-119.96508

Point ID #	Lat. North	Long. West
69	33.84865	-119.92316
70	33.87038	-119.88247
71	33.86804	-119.87060
72	33.86110	-119.79017
73	33.86351	-119.77130
74	33.85995	-119.74390
75	33.86233	-119.68783
76	33.87330	-119.65504
77	33.88594	-119.62617
78	33.88688	-119.59423
79	33.88809	-119.58278
80	33.89414	-119.54861
81	33.90064	-119.51936
82	33.91569	-119.48263
83	33.91094	-119.46137
84	33.90424	-119.42422
85	33.90219	-119.40730
86	33.90131	-119.38373
87	33.90398	-119.36333
88	33.90635	-119.35345
89	33.91304	-119.33280
90	33.91829	-119.32206
91	33.48250	-119.16874
92	33.44235	-119.16797
93	33.40555	-119.14878
94	33.39059	-119.13283
95	33.36804	-119.08891
96	33.36375	-119.06803
97	33.36241	-119.04812
98	33.36379	-119.02811
99	33.36879	-118.99797
100	33.37441	-118.98194
101	33.38001	-118.96972
102	33.38914	-118.95492
103	33.40515	-118.93661
104	33.44006	-118.91519
105	33.48414	-118.90712
106	33.52444	-118.91492
107	33.53834	-118.92271
108	33.58616	-118.99540
109	33.59018	-119.02374
110	33.58516	-119.06745
111	33.58011	-119.08521
112	33.54367	-119.14460
113	33.51161	-119.16367

Summary of the Proposed Regulatory Amendments

The proposed regulatory changes would clarify that “submerged lands” are within the Sanctuary boundary, i.e., part of the Sanctuary. This would update the boundary regulation to make it consistent with the revised Designation Document. (See explanation of boundary clarification in preceding discussion of proposed revised Designation Document.) The Sanctuary’s outer boundary coordinates and description of the shoreline boundary demarcation are also proposed for technical corrections using the North American Datum of 1983, and to clarify that the shoreline boundary is the Mean High Water Line (MHWL) of Island shores. Since designation the area of CINMS has been described as approximately 1252.5 square NM. However, adjusting for technical corrections and using updated technologies, the CINMS area is now calculated as approximately 1243 square NM. The legal description of CINMS is proposed to be updated to reflect this change. This update would not constitute a change in the geographic area of the Sanctuary but rather an improvement in the estimate of its size.

The proposed regulations would also modify the existing (1982) oil and gas regulation by removing the oil spill contingency equipment requirements, and modifying exceptions to this prohibition. The equipment requirements are outdated and unnecessary since Minerals Management Service lease agreement terms prescribe more stringent mandatory oil spill contingency plans. The following exceptions would be omitted for this prohibition: national defense; to respond to an emergency threatening life, property, or the environment; and as may be permitted by the Director in accordance with 15 CFR 922.48 and 922.72. These exceptions are not specific to the current regulation, but rather are “boilerplate” generic exceptions to the current prohibitions. The proposed revised regulations fine-tune the exceptions, as has been done in the regulations for more recently designated sanctuaries, so only if an exception is possibly applicable is it referenced for a particular prohibition. Accordingly, removal of the above exceptions is proposed because the limited exception for hydrocarbon exploration, development, or production is already provided within the regulation itself, because exploring for, developing, and producing hydrocarbons is not envisionable as a necessary activity to respond to an emergency threatening life, property, or the environment, and because such an activity could not meet the permit criteria requirements under 15 CFR 922.48 and 922.72. Department of Defense activities are addressed elsewhere in the regulations. Further, no such exceptions have ever been sought at CINMS.

The proposed regulations would also prohibit exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to hydrocarbon production allowed under the regulations. “Mineral” is defined by the NMSP program-wide regulations as clay, stone, sand, gravel, metalliferous ore, non-metalliferous ore, or any other solid material or other matter of commercial value. 15 CFR 922.3. Mineral extraction activities could involve scraping the Sanctuary’s seabed surface and/or excavation of pits and tunnels into the seabed. This prohibition would protect Sanctuary resources and qualities from potentially damaging effects of offshore mining activities, including but not limited to: destruction and direct smothering of the benthic biota; alteration of the seabed surface profile; potential harm to fisheries; introduction of pollutants (e.g., drill cuttings and mud) that could cause interference with the filtering, feeding, or respiratory functions of marine organisms; loss of food sources and habitat for some species; possible lowered photosynthesis and oxygen levels; and degraded appearance of the water itself. Finally, prohibition of mining within the Sanctuary would reduce the risk of potential disturbance to underwater historical resources either through physical disturbance or increased turbidity, which would result in direct long-term beneficial impact to historical resources. A prohibition on mineral activities within the Sanctuary would be consistent with the prohibition on alteration of or construction on or in the submerged lands discussed below.

The proposed regulations would also clarify and otherwise modify the existing (1982) regulation prohibiting discharging or depositing any material or other matter. Clarifications include that: the

regulation applies to discharges and deposits “from within or into the Sanctuary” (“into” is intended to make clear that not only discharges and deposits originating in the Sanctuary (including from vessels in the Sanctuary), but also discharges and deposits from aircraft above the Sanctuary, from docks and piers extending over the Sanctuary, and from cliffs and other land adjacent to the Sanctuary, for example, are included in the prohibition); the exception for fish, fish parts, or chumming materials (bait) applies only to such discharges or deposits made during the conduct of lawful fishing activity within the Sanctuary; and the exception for biodegradable effluent discharges from marine sanitation devices applies only to operable Type I or II marine sanitation devices approved by the United States Coast Guard in accordance with the Federal Water Pollution Control Act, as amended. The existing exception for vessel wastes “generated by marine sanitation devices” was intended to prohibit the discharge of untreated sewage into the Sanctuary; the proposed clarification to this exception makes express that such discharges are only allowed if generated by Type I or II marine sanitation devices. (Type I and Type II marine sanitation devices treat wastes, but Type III marine sanitation devices do not.) In addition, the discharge and deposit regulation would be modified by removing the exception for discharging or depositing meals onboard vessels. Coast Guard regulations prohibit discharge of food wastes (garbage) within three NM and prohibit discharge of food wastes unless ground to less than one inch within three to twelve NM. The proposed Sanctuary regulation modification would mirror the Coast Guard regulations within three NM and provide increased protection to Sanctuary resources and qualities from such marine debris vis-à-vis the Coast Guard regulations in the area of the Sanctuary beyond three NM. The proposed clarifications and modification are intended to achieve increased protection of Sanctuary resources and qualities.

Finally, the discharge and deposit regulation would be augmented by adding a prohibition on discharging or depositing any material or other matter from beyond the boundary of the Sanctuary that subsequently enters the Sanctuary and injures a Sanctuary resource or quality. “Sanctuary resource” is defined at 15 CFR 922.3 as “any living or non-living resource of a National Marine Sanctuary that contributes to the conservation, recreational, ecological, historical, research, educational, or aesthetic value of the Sanctuary, including, but not limited to, the substratum of the area of the Sanctuary, other submerged features and the surrounding seabed, carbonate rock, corals and other bottom formations, coralline algae and other marine plants and algae, marine invertebrates, brine-seep biota, phytoplankton, zooplankton, fish, seabirds, sea turtles and other marine reptiles, marine mammals and historical resources.” “Sanctuary quality” is defined at 15 CFR 922.3 as “any of those ambient conditions, physical-chemical characteristics and natural processes, the maintenance of which is essential to the ecological health of the Sanctuary, including, but not limited to, water quality, sediment quality and air quality.” This modification would provide consistency with the regulatory language of other more recently designated sanctuaries, and help to protect Sanctuary resources and qualities from negative influences originating outside the boundaries of the CINMS.

The proposed regulatory changes would also modify the existing prohibition against altering the seabed of the Sanctuary or constructing a structure thereon. The term “seabed” would be replaced with “submerged lands” to be consistent with language used in the NMSA. In addition, the geographic extent of this regulation would be expanded from the first 2 NM offshore to the entire area of the Sanctuary in order to ensure protection of the diverse accentuated bottom relief, varied substrate, and concomitant benthic habitats of the Sanctuary, and wording would be conformed with similar regulations at more recently designated sanctuaries. Another proposed change to this regulation would modify the exception for “bottom trawling from a commercial vessel” to provide an exception for activities incidental and necessary to “conduct lawful fishing activity.” This broadening of the exception would encompass other bottom-touching gear types, such as pots and traps, which the drafters of the original regulations apparently did not realize could alter the seabed. This proposed change would thus remove any uncertainty about the existing regulation's applicability to such gear types.

The proposed regulatory changes would also specify that abandoning, by which is meant leaving without intent to remove, any structure, material, or other matter on or in the submerged lands of the Sanctuary, is prohibited. This change would be consistent with similar regulations at more recently designated sanctuaries and would help protect the Sanctuary from debris (e.g., wrecked vessels or seabed research equipment) abandoned by Sanctuary users. This change is consistent with the U.S. Ocean Action Plan: The Bush Administration's Response to the U.S. Commission on Ocean Policy. In this Action Plan the Administration acknowledges the harmful effects marine debris has on valuable marine resources, and calls for the re-establishment of the Interagency Marine Debris Coordinating Committee (re-established in December 2004), of which NOAA is a member.

The proposed regulatory changes would also modify the existing (1982) vessel approach regulation so that the prohibition against vessel operation within 1 NM of any of the Islands would apply not only to vessels engaged in the trade of carrying cargo and vessels engaged in the trade of servicing offshore installations but also to all vessels of 300 gross registered tons or more (excluding fishing and kelp harvesting vessels). The intent of this modification is to protect the sensitive nearshore areas off the Islands, including kelp forests, rocky reefs, and other areas, from the potential impacts of large-vessel groundings and collisions, including, but not limited to, cruise ships. The NMSP developed the proposed modified prohibition to more directly address the Sanctuary's concern that very large vessels, regardless of their purpose, not approach and put at risk sensitive nearshore areas of the Sanctuary.

The proposed regulatory changes would also include a modification to the existing (1982) prohibition on removing or damaging any historical or cultural resource. The proposed modification would add "moving" and "possessing" to the existing prohibition; would replace "damage" with "injure," a term defined at 15 CFR 922.3; and add "attempting" to move, remove, injure, or possess as a prohibition. The intent of this modification is to provide added protection to these fragile, finite, and non-renewable resources so they may be studied, and so appropriate information about them may be made available for the benefit of the public. The proposed regulation would also replace "historical or cultural resource" with "Sanctuary historical resource" to be consistent with regulatory language used at several other more recently designated national marine sanctuaries. "Historical resource" is defined in NMSP program-wide regulations as "any resource possessing historical, cultural, archaeological or paleontological significance, including sites, contextual information, structures, districts, and objects significantly associated with or representative of earlier people, cultures, maritime heritage, and human activities and events. Historical resources include 'submerged cultural resources', and also include 'historical properties', as defined in the National Historic Preservation Act, as amended, and its implementing regulations, as amended." (15 CFR 922.3).

The proposed regulatory changes would also include a new prohibition on take of marine mammals, seabirds, and sea turtles, except as expressly authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under one of these acts. The intent of this regulation is to bring a special focus to protection of the diverse and vital marine mammal and seabird populations and the sea turtles of the Sanctuary. This area-specific focus is complementary to the prohibitions against taking promulgated by other resource protection agencies, especially given that other federal and state authorities must spread limited resources over much wider geographic areas. This regulation would be consistent with regulations at several other more recently designated national marine sanctuaries, and would provide a greater deterrent due to the higher civil penalties afforded under the NMSA than the penalties provided by the MMPA, ESA, and MBTA. Further, the prohibition would cover all marine mammals, sea turtles, and seabirds within or above the Sanctuary. The Sanctuary's proposed regulation would not apply if an activity (including fishing in a federally or state-approved fishery) that does or might cause take of marine mammals, seabirds, or sea turtles has been expressly authorized to do so under the MMPA, ESA, or MBTA or an implementing regulation. With this proposed regulation, if NMFS or the USFWS issue a

permit for the take of a marine mammal, seabird, or sea turtle, such taking would not be prohibited by the NMSP and therefore would not require a permit from the Sanctuary unless the activity would also violate another Sanctuary prohibition.

“Take” is defined in the NMSP program-wide regulations at 15 CFR 922.3. The proposed prohibition on take of marine mammals, seabirds, and sea turtles would be complementary to the current regulation prohibiting disturbing seabirds or marine mammals by flying motorized aircraft at less than 1000 feet over the waters within one NM of any Island. The current regulation remains unique and important in that it provides a special focus on a specific type of activity, operation of motorized aircraft, within the particularly sensitive environments of the Sanctuary. The current regulation includes several exceptions (for enforcement purposes, to engage in kelp bed surveys, or to transport persons or supplies to or from an Island), which are still required to comply with the MMPA, ESA, MBTA, and any regulations, as amended, promulgated under these acts.

The proposed regulatory changes would also prohibit possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as expressly authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA. This proposed regulation would serve to provide a greater deterrent against violations of existing laws protecting marine mammals, seabirds, and sea turtles than that offered by those other laws alone. This proposed regulation would also be consistent with recent regulations adopted by other national marine sanctuaries and would enhance protection provided by the prohibition on the take of marine mammals, seabirds, and sea turtles discussed above. With this proposed regulation, if NMFS or the USFWS issues a permit for the possession of a marine mammal, seabird, or sea turtle, it would not be prohibited by the NMSP and therefore would not require a permit from the Sanctuary unless the activity would also violate another Sanctuary prohibition.

The proposed regulatory changes would include a prohibition on marking, defacing, damaging, moving, removing, or tampering with any sign, notice or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary. This prohibition is designed to protect Sanctuary property used for purposes including demarcation, enforcement, regulatory information, education, outreach, and research. This new proposed regulation would be consistent with other sanctuaries’ regulations.

The proposed regulatory changes would prohibit introducing or otherwise releasing from within or into the Sanctuary an introduced species, except striped bass (*Roccus saxatilis*) released during catch and release fishing activity. “Introduced species” is defined to mean: (1) a species (including but not limited to any of its biological matter capable of propagation) that is non-native to the ecosystems protected by the Sanctuary; or (2) any organism into which genetic matter from another species has been transferred in order that the host organism acquires the genetic traits of the transferred genes. This prohibition is designed to help reduce the risk from introduced species, including their seeds, eggs, spores, and other biological material capable of propagating. The intent of the prohibition is to prevent injury to Sanctuary resources and qualities, to protect the biodiversity of the Sanctuary ecosystems, and to preserve the native functional aspects of the Sanctuary ecosystems, all of which are put at risk by introduced species. Introduced species may become a new form of predator, competitor, disturber, parasite, or disease that can have devastating effects upon ecosystems. For example, introduced species impacts on native coastal marine species of the Sanctuary could include: replacement of a functionally similar native species through competition; reduction in abundance or elimination of an entire population of a native species, which can affect native species richness; inhibition of normal growth or increased mortality of the host and associated species; increased intra- or interspecies competition with native species; creation or alteration of original substrate and habitat; hybridization with native species; and direct or indirect

toxicity (e.g., toxic diatoms). Changes in species interactions can lead to disrupted nutrient cycles and altered energy flows that ripple with unpredictable results through an entire ecosystem. Exotic species may also pose threats to endangered species, and native species diversity. A number of non-native species now found in the Sanctuary region were introduced elsewhere on the west coast but have spread through hull-fouling and accidental introductions.

The proposed introduced species regulation includes an exception for striped bass (*Roccus saxatilis*) released during catch and release fishing activity. Striped bass were intentionally introduced in California in 1879, and in 1980 the California Department of Fish and Game initiated a striped bass hatchery program to support the striped bass sport fishery, which according to the California Department of Fish and Game is one of the most important fisheries on the Pacific Coast. The California Department of Fish and Game manages the striped bass fishery through a Striped Bass Management Conservation Plan. The proposed regulation is intended to acknowledge that striped bass are the focus of an established state-managed sport fishery and, since they consequently may be caught within the Sanctuary, make an exception for striped bass released during catch and release fishing activity.

The proposed regulatory changes would prohibit operating a MPWC within waters of the Channel Islands National Park, established by 16 U.S.C. 410(ff), which states that the boundaries of Channel Islands National Park include San Miguel and Prince Islands, Santa Rosa, Santa Cruz, Anacapa and Santa Barbara Islands, including the rocks, islets, submerged lands, and waters within one NM of each island, as depicted on the map entitled, "Proposed Channel Islands National Park" numbered 159-20,008 and dated April 1979. This proposed regulation would mirror an existing National Park Service ban on use of MPWC within waters of the Channel Islands National Park, and is intended to provide added deterrence for purposes of ensuring protection of the Sanctuary's sensitive nearshore marine wildlife and habitats. The Channel Islands National Park staff have observed an increase in use of MPWC within the park over the last several years, and park staff issue several dozen warnings per year for violation of this ban. For consistency (including enforcement) purposes the existing National Park Service definition of MPWC is proposed to be adopted for this proposed Sanctuary regulation. The National Park Service definition is as follows:

"Motorized personal watercraft" means a vessel, usually less than 16 feet in length, which uses an inboard, internal combustion engine powering a water jet pump as its primary source of propulsion. The vessel is intended to be operated by a person or persons sitting, standing or kneeling on the vessel, rather than within the confines of the hull. The length is measured from end to end over the deck excluding sheer, meaning a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline. Bow sprits, bumpkins, rudders, outboard motor brackets, and similar fittings or attachments, are not included in the measurement. Length is stated in feet and inches. 36 CFR 1.4(a).

MPWCs operate in a manner unique among recreational vehicles and pose a threat to wildlife. Their shallow draft enables them to penetrate areas not available to conventional motorized watercraft (NPS 2000, MOCZM 2002). The high speed and maneuverability of MPWCs, along with the tendency to operate them near the shore and in a repeated fashion within a confined area, results in recurring disturbance to animals and habitats (Rodgers and Smith 1997, Snow 1989). Studies have shown that the use of MPWCs in nearshore areas can increase flushing rates, reduce nesting success of certain bird species, impact spawning fish, and reduce fishing success (Burger 1998, Snow 1989). The National Park Service (2000, 2004) identified several of these impacts along with interruption of normal activity, avoidance and displacement, loss of habitat use, interference with movement, direct mortality, interference with courtship, alteration of behavior, change in community structure, elevated noise levels,

and damage to aquatic vegetation. Further, offshore marine mammals or surfacing birds may be unaware of the presence of these vehicles due to their low frequency sound; when the inability to detect the vehicles is combined with their high speed and rapid and unpredictable movements, both animals and operators are at risk (Snow 1989).

Water quality concerns related to use of MPWC, and in particular those with two-stroke engines, include discharge of oil and gas, and air pollutants. MPWC using two-stroke engines may discharge as much as 25 percent of their gas and oil emissions directly into the water (NPS 2000). Two-stroke engines may also expel lubricating oil as part of their exhaust, and emit air pollutants such as volatile organic compounds, nitrogen oxides, particulate matter, and carbon monoxide (NPS 2004).

A review of information currently available from MPWC manufacturers indicates that they have made efforts to reduce emissions and noise through use of more efficient four-stroke engines as well as other technology (e.g., Bombardier Recreational Products, Inc. 2005a, 2005b; Personal Watercraft Industry Association 2005). However, it is not clear that such improvements have rendered emission and noise impacts due to MPWC insignificant. While industry sponsored studies indicate that MPWCs are no louder than similar motorized vessels under analogous conditions, other studies indicate that because MPWCs travel repeatedly in the same area, continually leaving and reentering the water, they create rapid cycles of noise that disturb humans and wildlife (MOCZM 2002). Industry improvements in noise and other emissions do not address impacts associated with the high speed, maneuverability, shallow draft, and nearshore operation of MPWC.

The area within one NM of island shores experiences the greatest visitor use and impact to sensitive nearshore Sanctuary marine resources. The proposed regulation would serve as an added deterrent to illegal MPWC use within the nearshore area and other waters of the Channel Islands National Park, and would carry a maximum civil penalty of \$130,000 per incident, per day.

The proposed regulatory changes would modify the existing (1982) regulation that states that all activities currently, (i.e., at the time of designation) carried out by the Department of Defense within the Sanctuary are essential for the national defense and, therefore, not subject to the prohibitions contained within the other Sanctuary regulations. As part of this modification the list of exempt military activities occurring within the Sanctuary would be updated to include present military activities if specifically identified in the Final Environmental Impact Statement (FEIS) to be released for this rule (see proposed regulatory text for precise requirements). In addition, consistent with the NMSA, mitigation and restoration or replacement of Sanctuary resources and qualities would be required when Department of Defense activity results in their injury, destruction, or loss. All Department of Defense activities would be required to be carried out in a manner that avoids to the maximum extent practicable any adverse impacts on Sanctuary resources and qualities.

The proposed regulatory changes would also add one exception pertaining to vessels of the Armed Forces to the two discharge regulations discussed earlier. Namely, an exception would be made for discharges allowed under section 312(n) of the Federal Water Pollution Control Act. Section 312(n), which was enacted in 1996, provides for uniform national standards for discharges, other than sewage, incidental to normal operation of vessels of the Armed Forces.

The proposed regulatory changes would also modify the Sanctuary's permit regulations by slightly augmenting the types of activities for which the Director may issue a permit, and by specifying the Sanctuary prohibitions to which permits may be applied. Activities that "assist in managing the Sanctuary" would be added to the types of activities (i.e., currently, research, education, and salvage) for which the Director may issue a permit. This addition provides a mechanism by which the Director may issue permits for otherwise prohibited activities that will further Sanctuary management. In addition,

“salvage or recovery operations” would be divided into two activities for which the Director may issue a permit: those that further salvage or recovery operations in connection with an abandoned shipwreck in the Sanctuary title to which is held by the State of California pursuant to the Abandoned Shipwreck Act of 1987, 43 U.S.C. 2101 et seq.; and those that further salvage or recovery operations in or near the Sanctuary in connection with a recent air or marine casualty. The intent of this proposed modification is to clarify that the Director may issue permits for salvage activities pertaining to both abandoned shipwrecks (invoking maritime heritage resource protection concerns) and recent air or marine casualties (invoking prompt response concerns). The permit regulation would authorize the Director to issue permits with regard to the prohibitions on: discharging and depositing; altering the submerged lands; abandoning structures, material, or other matter on or in the submerged lands; nearshore operation of vessels; disturbing a seabird or marine mammal by aircraft overflight below 1000 feet within 1 NM of the Islands; moving, removing, injuring or possessing, or attempting to move, remove, injure or possess a Sanctuary historical resource; taking any marine mammal, sea turtle or seabird within or above the Sanctuary; possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird; and operating a MPWC within waters of the Channel Islands National Park.

Another proposed modification to the permit regulations would, based on the decades of permitting experience the NMSP now has, strengthen and augment the criteria the Director is to use when evaluating permit applications. Whereas the existing regulation simply indicates that the Director shall evaluate certain matters in deciding whether to grant a permit, the proposed modified regulation would state that the Director may not issue a permit unless the Director finds that: the proposed activity will have at most short-term and negligible adverse effects on Sanctuary resources and qualities; the duration of the proposed activity is no longer than necessary to achieve its stated purpose; the proposed activity will be conducted in a manner compatible with the primary objective of protection of Sanctuary resources and qualities, considering the extent to which the conduct of the activity may diminish or enhance Sanctuary resources and qualities, any potential indirect, secondary, or cumulative effects of the activity, and the duration of such effects; and it is necessary to conduct the proposed activity within the Sanctuary. The required findings would also include modifications of several concepts that serve as review criteria in the existing regulation. Whereas the existing regulation simply requires the Director to evaluate the general professional and financial responsibility of the applicant, the revised review criteria clarify that the Director must find that the applicant is professionally qualified to conduct and complete the proposed activity; and that the applicant has adequate financial resources available to conduct and complete the proposed activity. In addition to several minor changes to the existing review criteria regarding the appropriateness of the methods proposed to conduct the activity, a new clause would be added emphasizing the consideration of potential indirect, secondary, and cumulative effects of the proposed activity on Sanctuary resources and qualities. In addition to minor modifications to the existing review criteria regarding whether permitted activities may diminish or enhance the value of the Sanctuary as a source of recreation, or as a source of educational or scientific information, consideration of the extent to which the conduct of the activity may result in conflicts between different users of the Sanctuary, and the duration of such effects, would be added. Finally, the modified regulation would require that the Director find that the reasonably expected end value of the proposed activity furthers Sanctuary goals and purposes and outweighs any potential adverse effects on Sanctuary resources and qualities from the conduct of the activity. The proposed modifications to the permit regulations would also state that in addition to the information listed in 15 CFR 922.48(b), all permit applications must include information the Director needs to make the findings described above.

The proposed modifications to the permit procedures and criteria would also further refine current requirements and procedures from general National Marine Sanctuary Program regulations (15 CFR 922.48(a) and (c)). The proposed modifications would also clarify existing requirements for permit

applications found in the Office of Management and Budget approved applicant guidelines (OMB Control Number 0648-0141). The revised section would also add language to the CINMS permit regulations about permit duration, timelines, and procedures for permit processing, permit review, and procedures and criteria for permit renewal.

The proposed modifications to the permit regulations would also expressly require that in addition to any other terms and conditions the Director deems appropriate, Sanctuary permits must require that the permittee agree to hold the United States harmless against any claims arising out of the permitted activities.

Although the NMSP is not currently proposing a prohibition on lightering in the Sanctuary, the NMSP is soliciting comments on such a potential prohibition and may issue a rule with such a prohibition at a future date. "Lightering" is defined at 15 CFR 922.3 as "at-sea transfer of petroleum-based products, materials, or other matter from vessel to vessel."

Miscellaneous Rulemaking Requirements

National Marine Sanctuaries Act

Section 304(a)(4) of the NMSA (16 U.S.C. 1434(a)(4)) requires that the procedures specified in section 304 for designating a National Marine Sanctuary be followed in modifying any term of designation. In particular, section 304 requires that the Secretary of Commerce submit to the Committee on Resources of the United States House of Representatives and the Committee on Commerce, Science, and Transportation of the United States Senate, no later than the same day as this notice is published, documents including a copy of this notice, the terms of the proposed designation (in this case, the proposed changes thereto), the proposed regulations, a draft management plan detailing the proposed goals and objectives, management responsibilities, and research activities for the area, and a draft environmental impact statement. In accordance with section 304, the required documents have been submitted to the specified congressional committees.

National Environmental Policy Act

When changing a term of designation of a National Marine Sanctuary, section 304 of the NMSA (16 U.S.C. 1434) requires the preparation of a draft environmental impact statement (DEIS), as defined by the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), and that the DEIS be made available to the public. NOAA has prepared a DMP/DEIS on the proposal and copies are available at the address and website listed in the Address section of this proposed rule. Responses to comments received on the DMP/DEIS will be published in the Final Management Plan (FMP)/FEIS and preamble to the final rule.

Executive Order 12866: Regulatory Impact

This proposed rule has been determined to be not significant within the meaning of Executive Order 12866.

Executive Order 12612: Federalism Assessment

NOAA has concluded that this regulatory action does not have federalism implications sufficient to warrant preparation of a federalism assessment under Executive Order 12612. As members of the Sanctuary Advisory Council, the California Resources Agency, California Department of Fish and Game, and the California Coastal Commission have been closely involved with the development of the management plan and proposed regulatory changes. In addition, staff from the NMSP's west coast region have consulted with the California Department of Boating and Waterways, California Department of Fish and Game, California State Lands Commission, and California Resources Agency. Also, in 2003, the NMSP consulted in writing with the above mentioned state agencies in addition to: the Office of the

Governor of California, the California Department of Parks and Recreation, the California Department of Water Resources, the California Department of Conservation, the California Environmental Protection Agency, the California State Water Resources Control Board, and the California Assembly Committee on Natural Resources.

Regulatory Flexibility Act

The Chief Counsel for Regulation of the Department of Commerce certified to the Chief Counsel for Advocacy of the Small Business Administration that this proposed rule, if adopted, would not have a significant economic impact on a substantial number of small entities. The factual basis for this certification is as follows:

Small business concerns operating within the Sanctuary include over 500 commercial fishermen, approximately 28 consumptive recreational charter businesses, approximately 27 non-consumptive recreational charter businesses, one MPWC business, approximately 20 marine salvage companies, and one aviation business. The approximately 40 small organizations operating within the Sanctuary include non-governmental organizations (NGO's) and/or non-profit organizations (NPO's) dedicated to environmental education, research, restoration, and conservation concerning marine and maritime heritage resources. There are no small governmental jurisdictions in the Sanctuary.

The proposed prohibition on exploring for, developing or producing minerals within the Sanctuary would not have a significant adverse impact on small entities. No small entities practice mining activities within the Sanctuary.

The proposed prohibition on abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary would have no significant adverse impacts on small entities within the Sanctuary because none of these operations are dependent upon a practice of abandoning structures or other matter on or in the submerged lands of the Sanctuary. However, should a small entity, such as a research entity, occasionally want to temporarily leave materials on the submerged lands of the Sanctuary, such as research equipment, a Sanctuary research permit could be applied for. In addition, this prohibition may offer an indirect beneficial effect to marine salvage companies whose services may be called upon to remove grounded, sinking, or submerged vessels that would be illegal to leave abandoned upon the submerged lands of the Sanctuary.

The proposed prohibitions on take and possession of certain animals are not expected to result in a significant adverse impact on small entities because those entities' operations may lawfully involve such takes under authorization granted by the Marine Mammal Protection Act (MMPA), Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), or any regulation promulgated under one of these acts. In addition, non-consumptive recreational charter businesses may receive indirect beneficial effects from these proposed regulations because the added protection to marine mammals, seabirds, and sea turtles could complement business activities focused on whale watching, kayaking, or other marine excursion tours. For example, the additional protection this prohibition affords to certain animals may potentially result in improved status of such animals at the Islands. This in turn may lead to the beneficial effect of more consumer interest in services rendered by non-consumptive recreational charter businesses.

The proposed prohibition on marking, defacing, damaging, moving, removing, or tampering with any Sanctuary-related sign, notice, placard, monument, stake, post, or other boundary marker is not expected to significantly adversely affect any of the small entities within the Sanctuary because routine small entity operations neither involve nor are likely to cause such damage.

The proposed prohibition on introducing or otherwise releasing from within or into the Sanctuary an introduced species is not expected to significantly adversely impact small entities because introducing or otherwise releasing an introduced species is not part of the business or operational practices associated with most of the identified small entities, and because, for those small entities whose operational practices may include catch and release of striped bass (*Roccus saxatilis*), (i.e., consumptive recreational charter businesses), an exception has been provided for striped bass released during catch and release fishing activity. By prohibiting such introductions, indirect benefits may result for certain small entities since their activities could potentially be negatively impacted by the spread of introduced species.

The proposed prohibition on operation of MPWC within waters of the Channel Islands National Park is not expected to have any significant adverse impact on these small entities. This activity is already illegal within the same area per a ban in place by the National Park Service (36 CFR 3.24), and as such MPWC businesses would not be subjected to any additional impact from this proposed regulation.

None of the small entities conducting activities within the Sanctuary is expected to be significantly adversely impacted by the proposed clarifications and corrections to the Sanctuary's boundary for the following reasons. The clarification that submerged lands are part of the existing Sanctuary boundary would not have a significant adverse impact on small entities within the Sanctuary because the Sanctuary has managed the submerged lands through administering protective measures for them since designation in 1980. The National Marine Sanctuary Program (NMSP) manages submerged lands as part of national marine sanctuaries and this is reflected in amendments to the NMSA passed in 1984 (16 U.S.C. 1432(3)). Similarly, proposed corrections and clarifications to the Sanctuary's boundary coordinates would not significantly adversely impact any of the small entities operating within the Sanctuary because the proposed corrections and clarifications are merely technical in nature. This update would not constitute a change in the geographic area of the sanctuary but rather an improvement in the estimate of its size. For example, boundary coordinates are proposed to be updated using the NAD 83, which provides more accurate information than that originally used to describe the Sanctuary boundary coordinates.

The proposed modification to the Sanctuary's discharge/deposit regulation that would clarify that discharges allowed from marine sanitation devices apply only to Type I and Type II marine sanitation devices would not introduce any new restrictions on small entities and would merely clarify the original intent of the Sanctuary's discharge regulation. To the extent that this clarification might affect customary, though illegal, sewage discharge practices of some small entities within the Sanctuary's 6 NM boundary, the adverse affect on those operations is expected to be less than significant because such discharges may legally occur beyond the Sanctuary's 6 NM boundary, or vessel sewage may be pumped out and disposed of at mainland ports and harbors. In addition, some small entities may receive indirect benefits from this clarification, especially as it might pertain to preventing large volume discharges from larger vessels, since it may contribute to sustaining favorable environmental quality in their area of operation.

The proposed modification to the Sanctuary's discharge/deposit regulation that would specify that the exception from the prohibition on discharging or depositing fish, fish parts, or chumming materials (bait) into the Sanctuary is valid only during the conduct of lawful fishing activity within the Sanctuary is not expected to have a significant adverse impact on small entities because it would not apply to conduct of lawful fishing activity within the Sanctuary. Although in some areas "chumming" marine waters is a practice that has been associated with non-consumptive recreational activities (e.g., attracting sharks for photography) or in some cases research activities (e.g., attracting seabirds for study), the NMSP is not aware of any such practices occurring within the Sanctuary. Furthermore, small entities not engaged in lawful fishing could apply for and, if appropriate, be granted a Sanctuary permit to conduct this otherwise prohibited discharge/deposit.

The proposed modification that would result in meals on board vessels no longer being excepted from the Sanctuary discharge/deposit prohibition would not result in a significant impact to small entities because it would merely introduce a new requirement that boaters not discard food wastes within three to six NM from Island shores. Such discharges/deposits are already prohibited under the Act to Prevent Pollution from Ships, 33 U.S.C. 1901 et seq., within the first three NM from Island shores, and also out to twelve NM unless the food wastes are ground to less than one inch. Therefore, boaters could either properly dispose of food waste at port or appropriately discard it beyond six NM (the Sanctuary's boundary) and out to twelve NM, when food wastes are ground to less than one inch. Resulting impacts may include additional costs and time potentially involved in traveling the additional distance from three to six NM offshore to appropriately dispose of food waste; however, these are not expected to be significant.

Significant adverse impacts are not expected to result for any of the Sanctuary's small entities from the proposed prohibition on discharging or depositing any material or other matter from beyond the boundary of the Sanctuary that subsequently enters the Sanctuary and injures a Sanctuary resource or quality because in the course of normal, lawful operations, no small entity activities (e.g., commercial fishing businesses, recreational fishing businesses, non-consumptive charter businesses, marine salvage companies, research and education entities, aircraft businesses) are expected to produce such discharges/deposits beyond the Sanctuary boundary. In addition, this proposed regulation would except discharges/deposits likely to come from vessel-based small entities, including: biodegradable effluent incidental to vessel use and generated by an operable Type I or II marine sanitation device (U.S. Coast Guard classification) approved in accordance with section 312 of the Federal Water Pollution Control Act (33 U.S.C. 1321 et seq.); biodegradable matter from a vessel resulting from deck wash down, vessel engine cooling water, or graywater as defined by section 312 of the FWPCA; vessel engine or generator exhaust; and fish, fish parts, or chumming materials (bait) used in or resulting from lawful fishing activity beyond the boundary of the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity there.

No significant impact on small entities is expected to result from the proposed regulation change that would extend the prohibition on alteration of the submerged lands of the Sanctuary from 2 NM to the outer 6 NM Sanctuary boundary, and would include a prohibition on placing any structure, material, or other matter on or in the submerged lands of the Sanctuary. The proposed regulation would modify the exception for "bottom trawling from a commercial vessel" to provide an exception for activities incidental and necessary to "conduct lawful fishing activity." This broadening of the exception would encompass other bottom-touching gear types, such as pots and traps, which the drafters of the original regulations apparently did not realize could alter the seabed. This proposed change would thus remove any uncertainty about the existing regulation's applicability to such gear types. Most other small entity operations do not normally involve, depend upon, or result in alteration of and/or placement of structures, material, or other matter on or in the submerged lands of the Sanctuary, and as such would not be significantly adversely affected by this regulation. Marine salvage companies, when engaged in salvage recovery operations to respond to a recent air or marine casualty, may have the potential to alter submerged lands. Such companies may apply for a Sanctuary permit. For those entities that do occasionally need to temporarily place materials on the submerged lands of the Sanctuary, such as research entities, the Sanctuary permitting process may also be used to potentially allow acceptable activities.

None of the small entities operating within the Sanctuary is expected to incur significant adverse impacts from the proposed prohibition of vessels of 300 gross registered tons or more (excluding fishing and kelp harvesting vessels) from operating within one NM of the Islands. Vessels larger than 300 gross registered tons are not utilized within the Sanctuary by consumptive or non-consumptive recreational charter businesses known to frequent the Sanctuary. Many cruise ships are larger than 300 gross registered tons,

but cruise ships have not been seen within the Sanctuary for more than ten years, and the NMSP is not aware of any nearshore routes near the Islands planned by the cruise line industry. It is unlikely that a marine salvage vessel would ever be large enough to be affected by this prohibition, but if necessary a Sanctuary salvage permit could be applied for. The operations of vessels larger than 300 gross registered tons conducting research or education activities that cannot be conducted without approaching the Islands inside of one NM from shore, an uncommon – less than once per year – but anticipated occurrence, may apply for and potentially be granted a Sanctuary research or education permit to do so. Indirect beneficial effects from this prohibition may result for some small entities that may benefit from a nearshore marine environment that is not subjected to large-scale grounding, collision, hazardous spill, and wildlife disturbance risks that very large vessels can pose.

Significant adverse impacts to small entities are not expected to result from the revision and strengthening of the Sanctuary's regulation protecting historical resources because the regulation would remain essentially the same with regard to how small entities may conduct their activities. For example, non-consumptive recreational charter businesses are expected to continue to operate chartered dive trips in a manner that does not involve the currently unlawful practice of damaging or removing submerged cultural resources. Thus, although the proposed revised regulation would be more comprehensive in the protection provided to these resources (prohibiting moving, possessing, injuring or attempting to move, remove, possess, or injure any Sanctuary historical resource), no significant adverse impact is expected for existing lawful business practices. The proposed regulation may offer an indirect beneficial effect for non-consumptive recreational charter businesses, as it would help ensure that submerged cultural resources remain intact for divers to enjoy.

The proposed modification of permit issuance criteria and procedures is not expected to significantly adversely affect any of the small entities within the Sanctuary as most of their activities do not require a Sanctuary permit. Furthermore, the proposed revised permit regulations not only maintain the status quo scope of activities for which a permit may potentially be issued (research, education, and salvage), but also add one more such activity category (for activities that will assist in managing the Sanctuary), in effect broadening the types of otherwise prohibited activities for which a permit may be granted. On the occasion that a Sanctuary-based research, education, salvage, or other project might require a permit, the proposed modified criteria and procedures are not expected to significantly adversely affect the activities of the requesting entities, because the proposed revised permit regulation in essence merely explicitly clarifies other concepts implicit in the current regulation or a part of agency practice with regard to it.

Because this action would not have a significant economic impact on a substantial number of small entities, no initial regulatory flexibility analysis was prepared.

Paperwork Reduction Act

This proposed rule involves an existing information collection requirement currently approved by OMB (OMB Control Number 0648-0141) under the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 et seq.

The proposed revised permit regulations would require the Director of the NMSP to consider the proposed activity for which a permit application has been received in terms of: duration; effects on Sanctuary resources, qualities, and users; indirect, secondary, and cumulative effects; and whether it is necessary to conduct the activity in the Sanctuary. The proposed modifications to the permit procedures and criteria (15 CFR 922.72) would further refine current requirements and procedures of the general National Marine Sanctuary Program regulations (15 CFR 922.48(a) and (c)). The proposed modifications would also clarify existing requirements for permit applications found in the Office of Management and Budget approved applicant guidelines (OMB Control Number 0648-0141). The revised permit

§ 922.71 Definitions.

In addition to those definitions found at 15 CFR 922.3, the following definitions apply to this subpart:

Introduced species means (1) a species (including but not limited to any of its biological matter capable of propagation) that is non-native to the ecosystems protected by the Sanctuary; or (2) any organism into which genetic matter from another species has been transferred in order that the host organism acquires the genetic traits of the transferred genes.

Motorized personal watercraft means a vessel, usually less than 16 feet in length, which uses an inboard, internal combustion engine powering a water jet pump as its primary source of propulsion. The vessel is intended to be operated by a person or persons sitting, standing or kneeling on the vessel, rather than within the confines of the hull. The length is measured from end to end over the deck excluding sheer, meaning a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline. Bow sprits, bumpkins, rudders, outboard motor brackets, and similar fittings or attachments, are not included in the measurement. Length is stated in feet and inches.

§ 922.72 Prohibited or otherwise regulated activities.

- (a) Except as specified in paragraphs (b) through (e) of this section, the following activities are prohibited by these regulations and thus unlawful for any person to conduct or cause to be conducted:
- (1) Exploring for, developing, or producing hydrocarbons within the Sanctuary, except pursuant to leases executed prior to March 30, 1981, and except the laying of pipeline pursuant to exploring for, developing, or producing hydrocarbons.
 - (2) Exploring for, developing, or producing minerals within the Sanctuary, except producing by-products incidental to hydrocarbon production allowed by paragraph (a) (1) of this section.
 - (3)(i) Discharging or depositing from within or into the Sanctuary any material or other matter except:
 - (A) Fish, fish parts, or chumming materials (bait) used in or resulting from lawful fishing activity within the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity within the Sanctuary;
 - (B) Biodegradable effluent incidental to vessel use and generated by an operable Type I or II marine sanitation device (U.S. Coast Guard classification) approved in accordance with section 312 of the Federal Water Pollution Control Act, as amended, (FWPCA), 33 U.S.C. 1321 et seq. Vessel operators must lock all marine sanitation devices in a manner that prevents discharge of untreated sewage;
 - (C) Biodegradable matter from a vessel resulting from deck wash down, vessel engine cooling water, or graywater as defined by section 312 of the FWPCA;
 - (D) Vessel engine or generator exhaust;
 - (E) Effluents routinely and necessarily discharged or deposited incidental to hydrocarbon exploration, development, or production allowed by paragraph (a)(1) of this section;
 - (F) Discharges allowed under section 312(n) of the FWPCA; or
 - (ii) Discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality, except those listed in subparagraphs (a)(3)(i)(B) through (F) of this section and fish, fish parts, or chumming materials (bait) used in or resulting from lawful fishing activity beyond the boundary of the Sanctuary, provided that such discharge or deposit is during the conduct of lawful fishing activity there.
 - (4) Drilling into, dredging, or otherwise altering the submerged lands of the Sanctuary; or constructing or placing any structure, material, or other matter on or in the submerged lands of the Sanctuary, except as incidental to and necessary to:
 - (i) Anchor a vessel;

- (ii) Install an authorized navigational aid;
 - (iii) Conduct lawful fishing activity;
 - (iv) Lay pipeline pursuant to exploring for, developing, or producing hydrocarbons; or
 - (v) Explore for, develop, or produce hydrocarbons as allowed by subparagraph (a)(1) of this section.
- (5) Abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary.
- (6) Except to transport persons or supplies to or from any Island, operating within one NM of any Island any vessel engaged in the trade of carrying cargo, including, but not limited to, tankers and other bulk carriers and barges, any vessel engaged in the trade of servicing offshore installations, or any vessel of three hundred gross registered tons or more, except fishing or kelp harvesting vessels.
- (7) Disturbing a seabird or marine mammal by flying a motorized aircraft at less than 1000 feet over the waters within one NM of any Island, except, if allowed under subparagraph (a)(9) of this section:
- (i) to engage in kelp bed surveys; or
 - (ii) to transport persons or supplies to or from an Island.
- (8) Moving, removing, injuring, or possessing, or attempting to move, remove, injure, or possess a Sanctuary historical resource.
- (9) Taking any marine mammal, sea turtle, or seabird within or above the Sanctuary, except as expressly authorized by the Marine Mammal Protection Act, as amended, (MMPA), 16 U.S.C. 1361 et seq., Endangered Species Act, as amended, (ESA), 16 U.S.C. 1531 et seq., Migratory Bird Treaty Act, as amended, (MBTA), 16 U.S.C. 703 et seq., or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA.
- (10) Possessing within the Sanctuary (regardless of where taken from, moved, or removed from) any marine mammal, sea turtle, or seabird, except as expressly authorized by the MMPA, ESA, MBTA, or any regulation, as amended, promulgated under the MMPA, ESA, or MBTA.
- (11) Marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary.
- (12) Introducing or otherwise releasing from within or into the Sanctuary an introduced species, except striped bass (*Roccus saxatilis*) released during catch and release fishing activity.
- (13) Operating a motorized personal watercraft within waters of the Channel Islands National Park, established by 16 U.S.C. 410(ff).
- (b)(1) The prohibitions in paragraphs (a)(3) through (13) do not apply to military activities carried out by DOD as of the effective date of these regulations and specifically identified in section 3.5.9 (Department of Defense Activities) of the Final Channel Islands National Marine Sanctuary Management Plan/Final Environmental Impact Statement (FMP/FEIS), Volume II: Environmental Impact Statement, 200_, authored and published by NOAA ("pre-existing activities"). Copies of the document are available from the Channel Islands National Marine Sanctuary, 113 Harbor Way, Santa Barbara, CA 93109. Other military activities carried out by DOD may be exempted by the Director after consultation between the Director and DOD.
- (2) A military activity carried out by DOD as of the effective date of these regulations and specifically identified in the section entitled "Department of Defense Activities" of the FMP/FEIS is not considered a pre-existing activity if:
- (A) it is modified in such a way that requires the preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act, 42 U.S.C. 4321 et seq., relevant to a Sanctuary resource or quality;
 - (B) it is modified, including but not limited to changes in location or frequency, in such a way that its possible adverse effects on Sanctuary resources or qualities are significantly greater than previously considered for the unmodified activity;

(C) it is modified, including but not limited to changes in location or frequency, in such a way that its possible adverse effects on Sanctuary resources or qualities are significantly different in manner than previously considered for the unmodified activity; or

(D) there are new circumstances or information relevant to a Sanctuary resource or quality that were not addressed in the FMP/FEIS.

(3) In the event of destruction of, loss of, or injury to a Sanctuary resource or quality resulting from an incident, including, but not limited to, discharges, deposits, and groundings, caused by a DOD activity, DOD, in coordination with the Director, must promptly prevent and mitigate further damage and must restore or replace the Sanctuary resource or quality in a manner approved by the Director.

(4) All DOD activities must be carried out in a manner that avoids to the maximum extent practicable any adverse impacts on Sanctuary resources and qualities.

(c) The prohibitions in subparagraphs (a)(3) through (10), (a)(12), and (a)(13) of this section do not apply to any activity conducted under and in accordance with the scope, purpose, terms, and conditions of a National Marine Sanctuary permit issued pursuant to 15 CFR 922.48 and 922.73.

(d) The prohibitions in subparagraphs (a)(3) through (11) and (a)(13) of this section do not apply to an activity necessary to respond to an emergency threatening life, property, or the environment.

(e) The prohibitions in subparagraphs (a)(3) through (11) and (a)(13) of this section do not apply to an activity necessary for valid law enforcement purposes in the Sanctuary.

§ 922.73 Permit procedures and issuance criteria.

(a) A person may conduct an activity prohibited by sec. 922.72(a)(3) through (10), (a)(12), and (a)(13) if such activity is specifically authorized by, and conducted in accordance with the scope, purpose, terms, and conditions of, a permit issued under sec. 922.48 and this section.

(b) The Director, at his or her sole discretion, may issue a permit, subject to terms and conditions as he or she deems appropriate, to conduct an activity prohibited by sec. 922.72(a)(3) through (10), (a)(12), and (a)(13) if the Director finds that the activity:

(1) Is appropriate research designed to further understanding of Sanctuary resources and qualities;

(2) Will further the educational value of the Sanctuary;

(3) Will further salvage or recovery operations in or near the Sanctuary in connection with a recent air or marine casualty;

(4) Will assist in managing the Sanctuary; or

(5) Will further salvage or recovery operations in connection with an abandoned shipwreck in the Sanctuary title to which is held by the State of California.

(c) The Director may not issue a permit under sec. 922.48 and this section unless the Director also finds that:

(1) The proposed activity will have at most short-term and negligible adverse effects on Sanctuary resources and qualities;

(2) The applicant is professionally qualified to conduct and complete the proposed activity;

(3) The applicant has adequate financial resources available to conduct and complete the proposed activity;

(4) The duration of the proposed activity is no longer than necessary to achieve its stated purpose;

(5) The methods and procedures proposed by the applicant are appropriate to achieve the goals of the proposed activity, especially in relation to the potential effects of the proposed activity on Sanctuary resources and qualities;

(6) The proposed activity will be conducted in a manner compatible with the primary objective of protection of Sanctuary resources and qualities, considering the extent to which the conduct of the activity may diminish or enhance Sanctuary resources and qualities, any potential indirect, secondary, or cumulative effects of the activity, and the duration of such effects;

(7) The proposed activity will be conducted in a manner compatible with the value of the Sanctuary as a source of recreation and as a source of educational and scientific information, considering the

- extent to which the conduct of the activity may result in conflicts between different users of the Sanctuary and the duration of such effects;
- (8) It is necessary to conduct the proposed activity within the Sanctuary;
 - (9) The reasonably expected end value of the proposed activity furthers Sanctuary goals and purposes and outweighs any potential adverse effects on Sanctuary resources and qualities from the conduct of the activity; and
 - (10) Any other matters the Director deems appropriate do not make the issuance of a permit for the proposed activity inappropriate.
- (d) Applications.
- (1) Applications for permits should be addressed to the Director, Office of National Marine Sanctuaries; ATTN: Manager, Channel Islands National Marine Sanctuary, 113 Harbor Way, Santa Barbara, CA 93109.
 - (2) In addition to the information listed in sec. 922.48(b), all applications must include information the Director needs to make the findings in paragraphs (b) and (c) of this section.
- (e) In addition to any other terms and conditions that the Director deems appropriate, a permit issued pursuant to this section must require that the permittee agree to hold the United States harmless against any claims arising out of the conduct of the permitted activities.

Appendix--Channel Islands National Marine Sanctuary Boundary Coordinates

Coordinates listed in this Appendix are unprojected (Geographic) and based on the North American Datum of 1983.

Point Number	ID	Latitude North	Longitude West
1		33.94138	-119.27422
2		33.96776	-119.25010
3		34.02607	-119.23642
4		34.07339	-119.25686
5		34.10185	-119.29178
6		34.11523	-119.33040
7		34.11611	-119.39120
8		34.11434	-119.40212
9		34.11712	-119.42896
10		34.11664	-119.44844
11		34.13389	-119.48081
12		34.13825	-119.49198
13		34.14784	-119.51194
14		34.15466	-119.59059
15		34.15142	-119.61254
16		34.13411	-119.66024
17		34.14635	-119.69780
18		34.15988	-119.76688
19		34.15906	-119.77800
20		34.15928	-119.79327
21		34.16213	-119.80347
22		34.16962	-119.83643
23		34.17266	-119.85240
24		34.17588	-119.88903

Point Number	ID	Latitude North	Longitude West
25		34.17682	-119.93357
26		34.17258	-119.95830
27		34.13535	-120.01964
28		34.13698	-120.04206
29		34.12994	-120.08582
30		34.12481	-120.11104
31		34.12519	-120.16076
32		34.11008	-120.21190
33		34.11128	-120.22707
34		34.13632	-120.25292
35		34.15341	-120.28627
36		34.16408	-120.29310
37		34.18231	-120.31224
38		34.19117	-120.32576
39		34.20224	-120.35122
40		34.20707	-120.41801
41		34.20520	-120.42859
42		34.19254	-120.46041
43		34.20540	-120.50728
44		34.20486	-120.53987
45		34.18182	-120.60041
46		34.10208	-120.64208
47		34.08151	-120.63894
48		34.05848	-120.62862
49		34.01940	-120.58567
50		34.01349	-120.57464
51		33.98698	-120.56582
52		33.95039	-120.53282
53		33.92694	-120.46132
54		33.92501	-120.42170
55		33.91403	-120.37585
56		33.91712	-120.32506
57		33.90956	-120.30857
58		33.88976	-120.29540
59		33.84444	-120.25482
60		33.83146	-120.22927
61		33.81763	-120.20284
62		33.81003	-120.18731
63		33.79425	-120.13422
64		33.79379	-120.10207
65		33.79983	-120.06995
66		33.81076	-120.04351
67		33.81450	-120.03158
68		33.84125	-119.96508
69		33.84865	-119.92316
70		33.87038	-119.88247

Point Number	ID	Latitude North	Longitude West
71		33.86804	-119.87060
72		33.86110	-119.79017
73		33.86351	-119.77130
74		33.85995	-119.74390
75		33.86233	-119.68783
76		33.87330	-119.65504
77		33.88594	-119.62617
78		33.88688	-119.59423
79		33.88809	-119.58278
80		33.89414	-119.54861
81		33.90064	-119.51936
82		33.91569	-119.48263
83		33.91094	-119.46137
84		33.90424	-119.42422
85		33.90219	-119.40730
86		33.90131	-119.38373
87		33.90398	-119.36333
88		33.90635	-119.35345
89		33.91304	-119.33280
90		33.91829	-119.32206
91		33.48250	-119.16874
92		33.44235	-119.16797
93		33.40555	-119.14878
94		33.39059	-119.13283
95		33.36804	-119.08891
96		33.36375	-119.06803
97		33.36241	-119.04812
98		33.36379	-119.02811
99		33.36879	-118.99797
100		33.37441	-118.98194
101		33.38001	-118.96972
102		33.38914	-118.95492
103		33.40515	-118.93661
104		33.44006	-118.91519
105		33.48414	-118.90712
106		33.52444	-118.91492
107		33.53834	-118.92271
108		33.58616	-118.99540
109		33.59018	-119.02374
110		33.58516	-119.06745
111		33.58011	-119.08521
112		33.54367	-119.14460
113		33.51161	-119.16367

E PROPOSED FINDINGS AND DETERMINATIONS

APPENDIX E

PROPOSED FINDINGS AND DETERMINATIONS

INTRODUCTION

Under the NMSA the Secretary of Commerce may designate an area as a national marine sanctuary and promulgate regulations implementing the designation if the Secretary makes a set of determinations and findings and has considered factors and conducted consultations described in the NMSA (16 U.S.C. 1433(a) and (b)). Although CINMS was designated in 1980, the NMSA states that terms of designation may be modified only by the same procedures by which the original designation was made. Because this action proposes to revise the CINMS terms of designation somewhat (see summary below), relevant determinations and findings based on required factors and consultations are described here. In addition, NEPA requires that the NMSP explain how the proposed actions and regulations described in this document relate to existing law and executive orders. This Appendix meets these NMSA and NEPA requirements by describing the consultations in Section I, making proposed determinations and findings and considering factors in Section II, and discussing the relation of the proposed action to existing laws and executive orders in Section III.

SUMMARY OF PROPOSED CHANGES TO THE SANCTUARY'S TERMS OF DESIGNATION

Since the NMSP is currently proposing several revisions to the CINMS terms of designation, the NMSP has provided the required findings and determinations from the NMSA after the following summary of the proposed revisions. Proposed revisions of the Description of the Area would: clarify that the submerged lands at CINMS are legally part of the Sanctuary and are included in the boundary description, replace the term "seabed" with "submerged lands of the Sanctuary", and express boundary coordinates based on the North American Datum of 1983 (NAD 83). Proposed changes to the Scope of Regulations would authorize Sanctuary regulation of: exploring for, developing, or producing minerals within the Sanctuary; discharging or depositing from beyond the boundary of the Sanctuary any material or other matter that subsequently enters the Sanctuary and injures a Sanctuary resource or quality; placing or abandoning any structure, material, or other matter on or in the submerged lands of the Sanctuary; moving, injuring, possessing, or attempting to move, injure, or possess a Sanctuary historical resource; taking any marine mammal, sea turtle, or seabird within or above the Sanctuary; possessing within the Sanctuary any marine mammal, sea turtle, or seabird; marking, defacing, damaging, moving, removing, or tampering with any sign, notice, or placard, whether temporary or permanent, or any monument, stake, post, or other boundary marker related to the Sanctuary; and introducing or otherwise releasing from within or into the Sanctuary an introduced species. Additional proposed changes to the Designation Document would provide: an updated and more complete description of characteristics that give the Sanctuary particular value; greater clarity on the applicability of Sanctuary emergency regulations (and in keeping with the National Marine Sanctuary Program regulations of general applicability, 15 CFR Part 922, Subpart E); revision of the Scope of Regulations section on consistency with international law with language taken directly from sec. 305(a) of the NMSA, which deals with application of regulations; an updated explanation of the effect of Sanctuary authority on preexisting leases, permits, licenses, and rights; and occasional wording fine-tuning in order to conform wording of the Designation Document, where appropriate, to wording used for more recently designated sanctuaries. No changes are proposed to be made to the "Fishing" and "Defense Activities" sections within Article V (Relation to Other Regulatory Programs) of the Designation Document.

SECTION I: CONSULTATIONS AND RESULTS UNDER THE NMSA

Under section 303(b)(2) of the NMSA, the NMSP is required to conduct a series of consultations with Congress, federal and state agencies, and other interested parties. Per this requirement, consultation letters were sent in May 2003 to the following:

- Department of Defense;
- Department of Energy;
- Department of the Interior;
- Department of State;
- Department of Transportation;
- Environmental Protection Agency;
- NOAA Fisheries;
- Pacific Fishery Management Council;
- Governor, State of California;
- California Resources Agency;
- California Department of Fish and Game;
- California Department of Water Resources;
- California Resources Agency;
- California State Lands Commission;
- California Fish and Game Commission;
- California Department of Boating and Waterways;
- California Department of Conservation;
- California Coastal Commission
- City of Santa Barbara
- County of Ventura
- County of Santa Barbara
- House of Representatives Resources Committee;
- Senate Committee on Commerce, Science, and Transportation;
- Members of California's Congressional Delegation
- Sanctuary Advisory Council, CINMS

The comments and ideas received in response to the consultation letters were considered in the preparation of this DMP/DEIS. The results of these consultations were also used to assist in making the findings and determinations described in Section II.

An additional set of consultations is also required by the NMSA and other laws, and will be conducted after this DMP/DEIS is released for public review. These additional consultations include:

- Section 7 Endangered Species Act consultation with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service (required by the Endangered Species Act);
- Essential Fish Habitat consultation with the National Marine Fisheries Service (required by the Magnuson-Stevens Act);
- Federal consistency consultation (determination) with the State's coastal zone management agency (again, if State waters are involved or if an activity outside State waters is reasonably likely to have an effect on any land or water use or natural resource of the coastal zone) (required by the Coastal Zone Management Act); and
- National Historic Preservation Act §106 consultation.

The results of these consultations will be included in this Appendix in the Final Management Plan/Final Environmental Impact Statement.

SECTION II: NMSA AND NEPA FINDINGS AND DETERMINATIONS

A. Determinations Required Under Section 303 of the NMSA

1. *The designation will fulfill the purposes and policies of the NMSA.*
2. *The area is of special national significance due to—*
 - A. *its conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, or esthetic qualities;*
 - B. *the communities of living marine resources it harbors; or*
 - C. *its resource or human-use values.*

These determinations and findings were made when the Sanctuary was designated in 1980. The proposed addition of submerged lands to the description of the Sanctuary boundary and the other proposed changes to the terms of designation described in this DMP/DEIS (see Appendix D) are consistent with and further support the original determinations and findings. The waters and submerged lands of the Sanctuary, and their associated marine life and historical/cultural resources, possess exceptional value in all categories (conservation, recreational, ecological, historical, scientific, cultural, archaeological, educational, and esthetic qualities). The proposed changes would provide additional protection to bottom habitats, water quality, living resources, and historical/cultural resources of the Sanctuary.

3. *Existing State and Federal authorities are inadequate or should be supplemented to ensure coordinated and comprehensive conservation and management of the area, including resource protection, scientific research, and public education.*
4. *Designation of the area as a national marine sanctuary will facilitate the objectives stated in paragraph 3.*

The original FEIS found that existing statutes did not provide a comprehensive management mechanism for marine waters surrounding the northern Channel Islands. The proposed changes to the terms of designation would allow existing laws relating to marine resource management, water quality protection, and marine species protection within the Sanctuary to be supplemented. The proposed changes would also allow for more comprehensive and coordinated management, including scientific research and public education, of living and non-living resources in the Sanctuary.

5. *The area is of size and nature that will permit the comprehensive and coordinated conservation and management.*

Although proposed changes to the terms of designation would clarify that submerged lands are included as part of Sanctuary's described boundary, and the Sanctuary's outer boundary coordinates and description of the shoreline boundary demarcation are also proposed for technical corrections and clarification, there would be no change to the Sanctuary's overall size.

B. Section 303(b)(1) of the NMSA (16 U.S.C. 1433(b)(1)) requires that the following factors be considered for purposes of determining if an area of the marine environment meets the standards set forth in section 303(a). Each factor is discussed below:

1. *The area's natural resource and ecological qualities, including its contribution to biological productivity, maintenance of ecosystem structure, maintenance of ecologically or commercially important or threatened species or species assemblages, maintenance of critical habitat or endangered species, and the biogeographic representation of the site.*

2. *The area's historical, cultural, archaeological, or paleontological significance.*

The exceptional natural resource and ecological qualities of the Channel Islands National Marine Sanctuary are described in the original FEIS on pages 11-55, and an updated description is provided in this document at Section 3.0 and Appendix D. The proposed changes to the activities that could be regulated (Appendix D) recognize the significance of the maintaining the Sanctuary's water quality, protecting sensitive species and habitats, and protecting historical/cultural resources of the Sanctuary.

3. *The present and potential uses of the area that depend on maintenance of the area's resources, including commercial and recreational fishing, subsistence uses, other commercial and recreational activities, and research and education.*

4. *The present and potential activities that may adversely affect the factors identified in subparagraphs 1, 2, and 3.*

A description of the human uses of the Sanctuary and its surrounding areas is provided in the original FEIS on pages 59-90, and an updated description is provided in this document at Section 3.0. The proposed changes to the terms of designation would allow for increased protection of the resources that support commercial and recreational fishing, diving, boating, research, and education.

5. *The existing State and Federal regulatory and management authorities applicable to the area and the adequacy of those authorities to fulfill the purposes of the NMSA.*

Management authorities and associated laws and regulations applicable to the Sanctuary are described in the original FEIS on pages F6-49, and an updated description is found in Section 5.0 of this document. Existing management authorities were considered in the final rule designating the Sanctuary in 1980 (45 FR 65198) and the additional protections and comprehensive management approach provided by the Sanctuary management plan and regulations continue to apply.

6. *The manageability of the area, including such factors as its size, its ability to be identified as a discrete ecological unit with definable boundaries, its accessibility, and its suitability for monitoring and enforcement activities.*

The proposed changes to the terms of designation would add submerged lands to the description of the Sanctuary's underlying boundary, as well as clarify and provide technical corrections to the Sanctuary's outer boundary, but would not change the overall size, manageability, accessibility or suitability for monitoring and enforcement activities in the Sanctuary.

7. *The public benefits to be derived from sanctuary status, with emphasis on the benefits of long-term protection of nationally significant resources, vital habitats, and resources which generate tourism.*

The public benefits from sanctuary status were described in the original 1980 FEIS and final rule designating the Sanctuary (45 FR 65198). The changes to the terms of designation proposed by this DMP/DEIS would enhance public benefits by providing for increased protection to water quality, seabed habitats and marine life, sensitive marine species, and cultural and historical resources of the Sanctuary

while still allowing for continued public use and enjoyment, education, and research of the Sanctuary environment.

8. *The negative impacts produced by management restrictions on income-generating activities such as living and nonliving resources development.*

9. *The socioeconomic effects of sanctuary designation.*

An analysis of the socioeconomic impacts of proposed regulatory changes is included in Section 4.0 of this DEIS. The socioeconomic analysis concludes that impacts of the proposed changes would be less than significant.

10. *The area's scientific value and value for monitoring the resources and natural processes that occur there.*

The area's scientific value and value for monitoring the resources and natural processes are described in the original FEIS, management plan, and final rule for designation of the Sanctuary. The changes to the terms of designation proposed by this DMP/DEIS will enhance the area's scientific and monitoring value by allowing for increased protection to seabed habitats and features, water quality, and living resources of the Sanctuary.

11. *The feasibility, where appropriate, of employing innovative management approaches to protect sanctuary resources or to manage compatible uses.*

The changes to the terms of designation, along with other regulatory and management changes proposed by this DMP/DEIS, represent an appropriate mechanism to manage and protect Sanctuary resources, and propose many innovative management approaches to education, research, and resource protection.

12. *The value of the area as an addition to the System.*

The Sanctuary has already been a part of the Sanctuary System since 1980.

C. Resource Assessment

1. *Present and potential uses of the area, including commercial and recreational fishing, research and education, minerals and energy development, subsistence uses, and other commercial, governmental, or recreational uses.*

Section 2.0 of this DMP/DEIS (Affected Environment) provides a full description of the current and potential uses of the area.

2. *Any commercial, governmental, or recreational resource uses in the areas that are subject to the primary jurisdiction of the Department of the Interior.*

The Department of the Interior has been contacted. Coordination and consultation with the National Park Service has occurred and will continue with regard to management and public use of the Channel Islands National Park. Additionally, consultation has occurred and will continue with the U.S. Fish and Wildlife Service and the Minerals Management Service.

3. Information prepared in consultation with the Secretary of Defense, the Secretary of Energy, and the Administrator of the Environmental Protection Agency, on any past, present, or proposed future disposal or discharge of materials in the vicinity of the proposed sanctuary

As noted above, these three agencies were consulted. The NMSP is not aware of any actively used past, present, or future disposal or discharge areas designated or to be designated within the Sanctuary by these agencies.

SECTION III: RELATION TO EXISTING LAWS AND EXECUTIVE ORDERS

NEPA requires that a discussion of the relation of the proposed action to other existing laws and executive orders be included. The relation of this proposed action to other legal requirements is discussed as follows:

Coastal Zone Management Act (CZMA)

The CZMA creates a partnership between the Federal and State governments that allows States to develop coastal zone management programs within a set of Federal requirements but tailored to their individual needs. The CZMA also requires that each Federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner that is, to the maximum extent practicable, consistent with the enforceable policies of the Federally-approved state coastal zone management program.

Located partially within State waters, the Sanctuary works closely with several California state departments and commissions. The NMSP will consult with the California Coastal Commission on the federal consistency of the proposed action with the California Coastal Zone Management Program.

Magnuson-Steven Fishery Conservation and Management Act (MSFCMA)

The MSFCMA governs the management and conservation of fisheries in Federal waters of the United States and created the Pacific Fishery Management Council (PFMC), along with seven other regional councils. Sanctuary staff work closely with the PFMC and NOAA Fisheries on matters pertaining to federally managed fisheries within the Sanctuary.

The MSFCMA also requires Federal agencies to consult with NOAA Fisheries regarding any agency action they authorize (e.g., issue permits for), fund, or undertake, that may adversely affect essential fish habitat (EFH). The NMSP will consult with NOAA Fisheries on the impact of the proposed action on EFH.

National Historic Preservation Act (NHPA)

The NHPA was enacted to help protect and preserve the historic heritage of the United States. Section 106 of the NHPA requires that Federal agencies take into account the effects of their activities and programs on historic properties (which are defined as any district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places) by providing the Advisory Council on Historic Preservation with the opportunity to comment on proposed actions. The NMSP will consult with Advisory Council on Historic Preservation on the impact of the proposed action on any historic or cultural resource in the Sanctuary.

Regulatory Flexibility Act (RFA)

The Regulatory Flexibility Act requires Federal agencies to consider the effects of their regulatory actions on small businesses and other small entities, and to minimize any undue disproportionate burden. If the regulations will have a significant economic impact on a substantial number of small businesses, then an agency must prepare an initial (IRFA) and final regulatory flexibility analysis (FRFA). The NMSP has not prepared an IRFA because the Chief Counsel for Regulation with the Department of Commerce has certified to the Small Business Administration that the proposed rule (Appendix D) will not have a significant impact on a substantial number of small entities.

Executive Order 12866 Cost-Benefit Analysis

Under Executive Order 12866, if a rule is determined to be significant, then a socioeconomic impact study (i.e., assessment of the costs and benefits of the regulatory action) must be conducted. Under 12866 a regulatory action is significant if the rule may:

- have an annual effect on the economy of \$100 million or more or adversely affecting in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- materially alter the budgetary impacts of entitlements, grants, user fees, or loan programs, or the rights and obligations of recipients thereof; or
- raises novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

The NMSP has concluded that the proposed rule addressed in this DMP/DEIS (see Appendix D) is not significant. The Office of Management and Budget has concurred with this conclusion.

Executive Order 13132 Federalism

Under Executive Order 13132, each agency must consult, to the extent practicable and permitted by law, with State and local officials early in the process of developing proposed regulations. These consultations should seek comment on the compliance costs or preemption, as appropriate to the nature of the rulemaking under development.

When an agency submits a draft final regulation to OMB for review under Executive Order 12866 prior to promulgation of the final regulation, the agency must include a separately identified portion of the preamble to the regulation as a "federalism summary impact statement" that must include:

- a description of the extent of the agency's prior consultation with State and local officials;
- a summary of the nature of their concerns and the agency's position supporting the need to issue the regulation; and
- a statement of the extent to which the concerns of State and local concerns have been met.

The NMSP has worked with and will continue to work with partner agencies within the State of California, local jurisdictions in the vicinity of the Sanctuary, and the Federal government in the development of this DMP/DEIS. A federalism summary impact statement will be prepared for the Final Management Plan/Final Environmental Impact Statement and its final rule.

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APPENDIX F

EIS MAILING LIST

The following officials, agencies and organizations will receive the Draft Management Plan/Draft Environmental Impact Statement. In addition, a CINMS public interest email list of over 800 individuals will be notified and informed about the documents and how to obtain them. The Draft Management Plan/Draft Environmental Impact Statement may be obtained by download from <https://channelislands.noaa.gov> or by mail in either CD or hard copy format by contacting:

Management Plan Coordinator, CINMS, 113 Harbor Way, Suite 150, Santa Barbara, California, 93109
or by email at mp.request@noaa.gov
or by fax to (805) 568-1582.

Agencies and Elected Officials

United States Senate

The Honorable Barbara Boxer
The Honorable Diane Feinstein

United States House of Representatives

The Honorable Lois Capps
The Honorable Elton Gallegly

United States Senate and House Committees

Chair, Senate Committee on Commerce, Science, and Transportation
Chair, House Resources Committee

Federal Agencies and Councils

Department of Energy, Director, Office of Environmental Policy and Guidance

Department of Transportation, Assistant Secretary for Governmental Affairs

Federal Aviation Administration, Associate Administrator, Office of Commercial Space Transportation

Department of the Interior

Director, Office of Environmental Policy and Compliance
U.S. Fish and Wildlife Service, Regional Director, Pacific Region
Minerals Management Service, Regional Director, Pacific OCS Region
National Park Service, Director, Pacific West Region
National Park Service, Superintendent, Channel Islands National Park
Environmental Protection Agency, Director, Office of Ocean, Wetlands, and Watersheds
Los Padres National Forest

Department of State, Deputy Assistant Secretary for Oceans and Fisheries

Department of Defense, Assistant Deputy Under Secretary for Defense for Environment

Deputy Assistant Secretary of the Navy (Environment)

Deputy Assistant Secretary of the Air Force (Environment, Safety and Occupational Health)

National Aeronautics and Space Administration

Director, Environmental Management Division

Director, Ames Research Center

United States Coast Guard

Commander, 11th Coast Guard District

Chief, Law Enforcement Division, 11th Coast Guard District

Commanding Officer, U.S. Coast Guard Station Channel Islands

NOAA Fisheries Southwest Region, Regional Administrator

Regional Water Quality Control Board

US Army Corps of Engineers, LA District

National Oceanic and Atmospheric Administration

Deputy Assistant Administrator, NOAA National Marine Fisheries Service

Assistant Administrator, NOAA National Environmental Satellite, Data, and Information Service

NOAA Coastal Services Center

National Environmental Satellite, Data, and Information Service (NESDIS), Polar Operational Satellite Program

Executive Director and Chair, Pacific Fishery Management Council

United States Environmental Protection Agency

Director, Office of Federal Activities

Region 9, Federal Activities Branch, Communities and Ecosystem Division

State Agencies, Commissions and Boards:

Governor, State of California

Secretary of Resources, California Resources Agency

State Historic Preservation Officer, California State Historical Resources Commission

Director, California Department of Fish and Game

Director, California Department of Parks and Recreation

Director, California Department of Water Resources

Executive Officer, California State Lands Commission

Executive Director, California Fish and Game Commission

Director, California Department of Boating and Waterways

Director, California Department of Conservation

Executive Director, California Coastal Commission

Secretary, California Environmental Protection Agency

Chair and Executive Officer, California State Water Resources Control Board

Beach Erosion Authority for Clean Oceans and Nourishment (BEACON)

California Assembly Committee on Natural Resources

Local Government:

County Government:

Santa Barbara County, Board of Supervisors
Santa Barbara County Water Agency
Santa Barbara County Planning and Development, Assistant Director
San Luis Obispo County Planning Department
Ventura County Board of Supervisors
Ventura County Executive Officer
Ventura County Harbor Department, Director
Ventura County Library
Ventura County Planning Division

Municipal Entities:

Goleta Sanitary District
Mayor, City of Morro Bay CA
Montecito Sanitary District
Morro Bay Harbor, Director
Port of Hueneme/Oxnard Harbor District, Executive Director
Port San Luis Harbor District
Santa Barbara City, Wastewater System Manager
Santa Barbara City Creeks Division, Parks and Recreation Department
San Buenaventura City, Economic Development Director
Santa Barbara, Mayor of
Santa Barbara Harbor, Harbor Operations Manager
Santa Barbara Public Library
Santa Barbara Waterfront Department, Director
Ventura Port District, General Manager
Ventura Harbor, Harbor Master

Sanctuary Advisory Council Representatives as of September 2005

Agosta, William - Agosta International Marine
Akins, Leah – California Resources Agency
Baird, Brian – California Resources Agency
Baker, Monica – Island Packers, Inc.
Baker, Lauri – Hotel Sales and Marketing, Santa Barbara
Barsky, Kristine – California Department of Fish and Game
Brumbaugh, Dan – American Museum of Natural History
Bull, Ann – Minerals Management Service
Cabugos, Paulette – Chumash Maritime Association
Davis, Gary – National Park Service
Dunn, W. Scott - Adventours Outdoor Excursions
Enriquez, Lyle – National Marine Fisheries Service
Fien, Ronald – U.S. Coast Guard
Galipeau, Russell – Channel Islands National Park
Glaser, Warren – Naturalist, Ventura CA
Grifman, Phyllis – Sea Grant, university of Southern California
Helms, Greg – The Ocean Conservancy

Helvey, Mark – National Marine Fisheries Service
Hoeflinger, Chris – Ventura County Commercial Fishermen’s Association
Kett, Eric – Sea Zen Marine Consulting (former) and Parcel Manager, Hollister Ranch, CA
Knowlton, Jim – Ocean Futures Society
Krieger, Lyn – Ventura County Harbor Department
Krop, Linda – Environmental Defense Center
LaCorte, Barbara – Hope School, Santa Barbara
Lum, Matthew - MJL Advisors, Inc.
Luzader, John – U.S. Coast Guard
Marshall, Jim – Commercial Fisherman, Santa Barbara CA
McCrea, Merit – SeaHawk Sportfishing Charters (former), Santa Barbara CA
Meester, Dianne – Santa Barbara County
Peveler, Jack – Ventura County Harbor Department
Piltz, Fred – Minerals Management Service
Roberson, Stephen - Graves, Roberson & Bourassa
Roth, Rebecca – California Coastal Commission
Schobel, Walt – U.S. Air Force
Spicer, William – Western Gate Publishing
Stone, Alex – U.S. Navy
Taylor, Craig – Santa Barbara, CA
Timm, Gary – California Coastal Commission
Vojkovich, Marija – California Department of Fish and Game
Warner, Robert – University of California, Department of Ecology, Evolution, & Marine Biology

Sanctuary Advisory Council Working Groups (active as of 2005)

Sanctuary Education Team
Conservation Working Group
Chumash Community Working Group
Commercial Fishing Working Group
Recreational Fishing Working Group
Military Working Group
Ports and Harbors Working Group

Other Private Organizations and Businesses

Alliance of Communities for Sustainable Fisheries
American Cetacean Society
AXYS Environmental Consulting Ltd.
Beacon Foundation
Bluewater Network
Bornholdt, Peron & Pratt, LLP
Carpinteria Valley Association
C-PORT
Cal – PORT
California Association of Harbor Masters and Port Captains
California Coastal Protection Network
California League of Conservation Voters, Santa Barbara
California Space Authority, Inc.

Chumash Maritime Association
Citizens for the Carpinteria Bluffs
Citizens for Goleta Valley
Citizens Planning Association
Citizens Planning Foundation
Coalition for Sustainable Transportation
Coastal Resource Information Center, Goleta CA
Commercial Fishermen of Santa Barbara, Inc.
Community Environmental Council, Santa Barbara
Conception Coast Project
Dave's Marine Fuel Service
David and Lucile Packard Foundation
Environmental Center of San Luis Obispo County
Environmental Defense Center
Friends of the Elephant Seal
Friends of the Ellwood Coast
Joint Oil/Fisheries Liaison Office
Gaviota Coast Conservancy
Get Oil Out
Goleta Valley Land Trust
Heal the Ocean
ICF Consulting
Land Trust for Santa Barbara County
League for Coastal Protection
League of Women Voters
Lockheed Martin Space Systems Company
Lompoc Dive Club
Lompoc Valley Republican Club
Los Cerritos Wetlands Task Force
Los Padres ForestWatch
McKenna Long & Aldridge LLP
More Mesa Preservation Coalition
Morro Coast Audubon Society
National OCS Coalition
National Wildlife Federation
Nature Conservancy of California
Natural Resources Defense Council
North Coast Alliance, central California
Nuevo Energy
Ocean Futures Society
Pacific Coast Federation of Fishermen's Association
Pacific Gas and Electric Company
Pacific Merchant Shipping Association
Padre Associates Inc.
Parrotfish Productions Ltd.
Project AWARE
Point Conception Ground Fish Association
Port San Luis Marine Institute
Regional Alliance for Information Networking
San Marcos Foothills Coalition

San Marcos Trout Club
Santa Barbara Audubon Society
Santa Barbara ChannelKeeper
Santa Barbara County Action Network
Santa Barbara Museum of Natural History
Santa Monica Mountain Trails Council
Save Ellwood Shores
Seafloor Surveys International, Inc.
Sea Foam Enterprises
Shoreline Preservation Fund, Santa Barbara
Sierra Club, Los Padres Chapter
Small Wilderness Area Preserves
Surfrider Foundation, Santa Barbara Chapter
Surfrider Foundation, Isla Vista Chapter
Surfrider Foundation, Ventura Chapter
Surfrider Foundation, San Luis Bay Chapter
The Ocean Conservancy
The Otter Project
Trout Unlimited
Trust for Public Land
UCLA Institute of the Environment
UCSB Environmental Affairs Board
Urban Creeks Council
URS Corp.
USC Wrigley Institute
Venoco, Inc.
Ventura County Commercial Fishermen's Association
Ventura County Economic Development Association
Ventura County Environmental Coalition
Vessel Assist
West Coast Seafood Processors Association
WET/tv Productions
Women's Environmental Watch

G PUBLIC COMMENTS AND RESPONSES

APPENDIX G
PUBLIC COMMENTS AND RESPONSES

THIS SECTION WILL BE COMPLETED AFTER THE PUBLIC COMMENT PERIOD ON THE DMP/DEIS, AND WILL APPEAR IN THE FINAL EIS

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